GENERAL LIBRARY
DEC 23 1919
UNIV. OF MICH.

VOL. 17, No. 12. REGISTERED IN U. S. PATENT OFFICE DECEMBER, 1919

# THE METAL INDUSTRY

WITH WHICH ARE INCORPORATED

THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER:

ELECTRO-PLATERS REVIEW

Entered as second class matter February 10, 1903, at the post-office at New York under the Act of 1879.

A MONTHLY JOURNAL RELATING TO THE METAL AND PLATING TRADES


# ANNOUNCEMENT

The undersigned respectfully wishes to announce that they,

**The U. S. Electro Galvanizing Co.**

**&**

**The National Galvanizing & Plating Equipment Corporation**

**of**

**52 Broadway, New York City**

have arranged to consolidate under the name and present organization of the U. S. ELECTRO GALVANIZING COMPANY, for the purpose of manufacturing and selling the full line of Patented Automatic Apparatus for Cleaning, Plating and Electro Galvanizing, formerly manufactured by each company.

We and the NATIONAL GALVANIZING & PLATING EQUIPMENT CORPORATION take this occasion to thank our many customers for past favors and to assure them that with our additional facilities and increased organization, we will be even better situated to take care of their wants than in the past.

## U. S. Electro Galvanizing Company

INCORPORATED 1906

Manufacturers of

**Electro-Plating, Electro Galvanizing and Cleaning Equipment**

OFFICES AND WORKS:

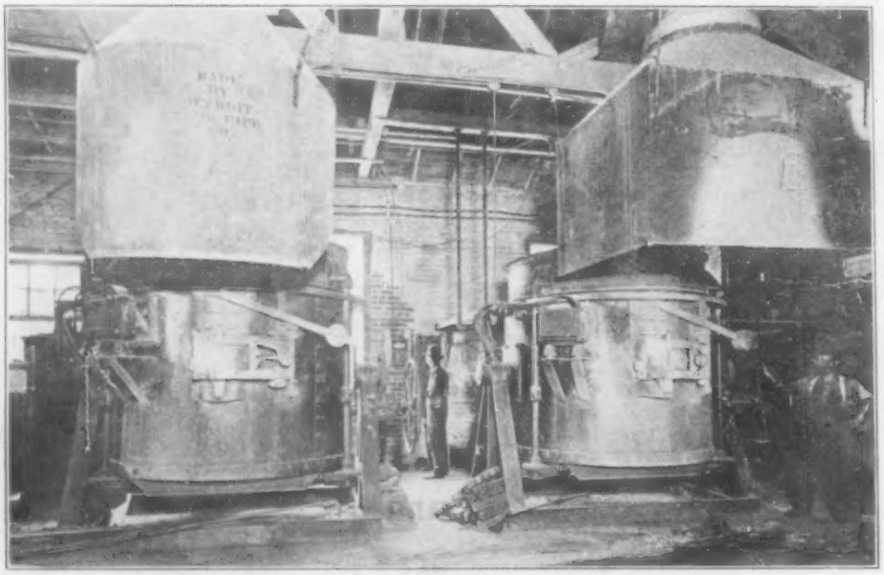
28-34 STOCKTON ST. BROOKLYN, N. Y.

FACTORIES:

1 to 9 Park Avenue, Brooklyn, N. Y. 56th and A. V. R. R., Pittsburgh, Pa.


United States and Canada, $1 Per Year Published Monthly by The Metal Industry Publishing Company 99 John Street, New York Other Countries, $2 Per Year

# BAILY ELECTRIC FURNACES
FOR
## Brass, Bronze, Zinc and Aluminum



Two Baily Furnaces—Capital Brass Co., Detroit, Michigan

**BETTER CASTINGS**

Because sulphur gases and oxides are not found in a non-oxidizing atmosphere.

**BETTER WORKING CONDITIONS**

Because the electric furnace performs the difficult melting tasks mechanically.

**BETTER PRODUCTION**

Because the Resistance Type furnace may be depended upon to produce the desired quantity of metal every day.

**A BETTER INVESTMENT**

Because the Baily Furnace pays for itself in metal saved alone. Maintenance costs, rates of current consumption, and rates of metal loss are guaranteed.

Baily Electric furnaces—fifty of them in operation or under construction in the non-ferrous metal field—have at present a total rating of more than 6000 K.W. and a daily production capacity of more than 500 tons.

**Write for booklet 7-B and complete information.**

## The Electric Furnace Company
**Alliance, Ohio**

BRITISH ISLES:
VERDON CUTTS & COMPANY,
**87 Fargate, Sheffield, England**

THE METAL INDUSTRY
WITH WHICH ARE INCORPORATED
THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER:
ELECTRO-PLATERS REVIEW

Vol. 17 NEW YORK, DECEMBER, 1919 No. 12

# FURTHER PROGRESS IN INGOT PRODUCTION.

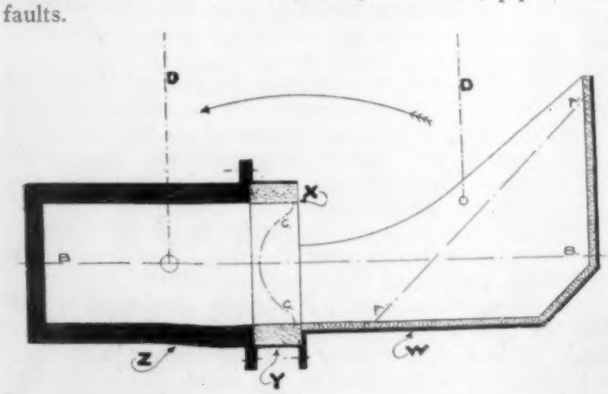
CASTING ALUMINUM BRONZES AT A LOW TEMPERATURE, WITH A MINIMUM FALL AND EXPOSURE TO THE AIR (WHILE MOLTEN) AND AN AUTOMATIC FEED.

WRITTEN FOR THE METAL INDUSTRY BY CHARLES MEIGH.

The system which is now being employed in France for casting a number of different alloys and particularly those easily oxidized when in a molten state, such as aluminum bronzes, has recently been improved to such an extent that alumina has been entirely eliminated and the strength of the metal increased. The many properties of aluminum bronzes with up to 10 per cent. of aluminum are well known, but the metal till quite recently has not been employed to any great extent on account of the large quantity of alumina which it contained making it commercially impossible to draw it into thin tubes or wire, and roll it into other standard sections without enormous wear on the tools employed and therefore high cost of production. This prevented it from replacing steels and other metals easily worked.

The object of this article is to outline the improved method of running ingots and to compare it with those previously employed.

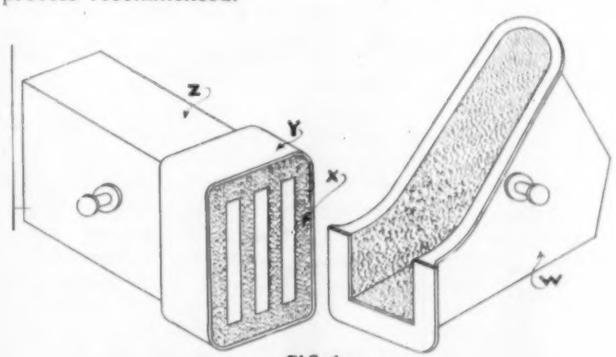
The chief difficulties to be overcome in the production of aluminum bronze ingots, intended to be worked hot or cold, by forging, rolling, drawing or stamping, are well known to be: alumina oxidation, blowholes, pipes, skin faults.




—FIG

MOLD AND LADLE READY FOR POURING.

The casting apparatus which has successfully overcome these difficulties by preventing the cause rather than producing a cure, is shown in Fig. 1 and Fig. 1a. Z is a metal ingot mould, for single or multiple ingots, furnished with a distance piece or box Y to carry the feeder head or dozzle X, which is made in sand or other suitable material with divisions corresponding to the ingot section if several ingots are run at the same time. The ladle or packet W, lined with refractory material, or left bare to suit the special requirements of various metals, is usually easily detachable, so that in cases where it is considered an advantage to leave the mould mounted on a stand, the ladle can be filled at the furnace to the level AA, and easily locked in line with the mould when the casting operation is to take place. But if the entire casting operation and filling of the ladle is done by the aid of a traveling crane, the ladle is left attached to the mould, and in this later case the tilting is effected by the chains DD. The metal when poured to a level AA is left to settle and cool down to the lowest temperature at which it is still molten. During this period the scum, slag, etc., which has had ample time to rise, is carefully removed, and the entire apparatus slowly tilted at an even speed, slowly or quickly to suit the requirements of the metal, to a level BB, at which the mould and dozzle are half full. The tilting continues till the mould is perpendicular and the final metal level is CC, the ingots are then demoulded, the dozzle replaced and the process recommenced.




—FIG. 1A.—

PERSPECTIVE VIEW OF MOLD AND LADLE APART.

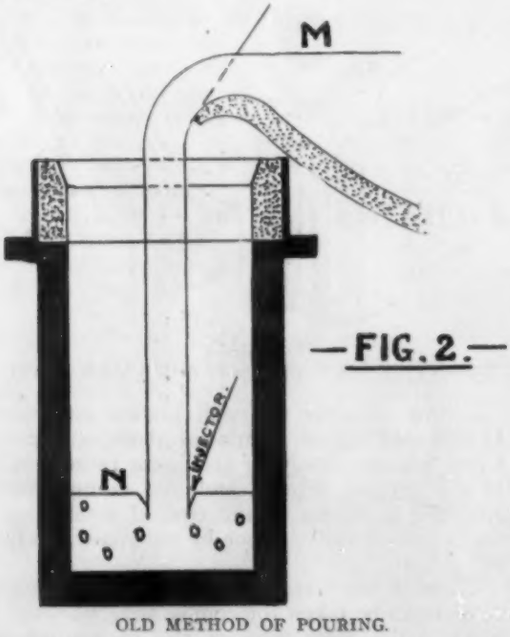
Let us now consider the well known difficulties in aluminum bronze ingots mentioned above, and compare the current process, studying the cause rather than the cure of the various defects, and also taking into consideration the questions of the cost of production and the substitution of skilled labor by automatic mechanical devices.

Figs 2 and 3 show two of the old methods of ingot casting, and can be taken for comparative purposes with Fig. 1. For the same purpose and to appreciate the internal action of a molten or fluid mass, undergoing transformation in shape, suppose that the three apparati indicated are made of a transparent substance such as glass, and filled with water or glycerine. It is fairly obvious that what takes place in that transparent fluid

also takes place in molten metal to greater or lesser extent, but with an additional factor, that of rapid solidification. And as the majority of impurities in metals are lighter than the metal, suppose the same impurities to be in the transparent fluid. Now the outstanding feature in Figs. 2 and 3 is the "injector," the action of which is seen when a liquid is poured or run from one receptacle to another, any impurity or foreign matter on the surface M is injected into the mass N together with a quantity of air, the greater part of which is imprisoned, owing to the rapid solidification.

In addition to this injection of impurities into the mass there is a considerable splash and agitation owing to which metal touches the walls of the mould in thin layers or spots, which are partially or completely solidified when the mass covers them, and in consequence skin faults are produced which cause infinite trouble and loss of material when the metal is being worked.

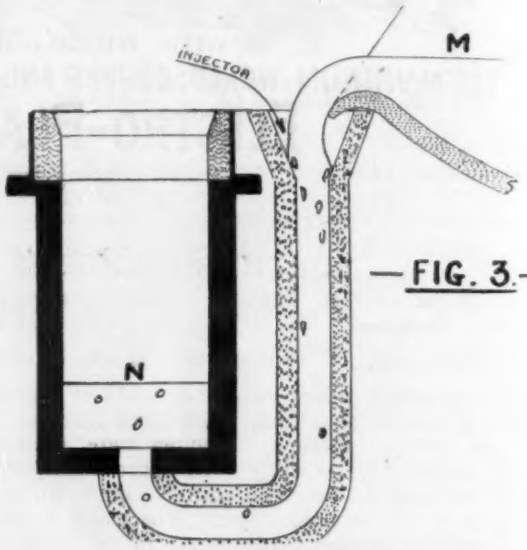
In addition to these actions, a maximum surface of the liquid is exposed to the atmosphere, and is actually oxidized at a speed proportional to its heat. This surface is easily calculated and is interesting to compare with the surface exposed in Fig. 1, to appreciate the importance of this oxidization. Suppose that the ingot to be run weighs 1,000 pounds, and the metal is poured with a 5-inch diameter flow, the surface exposed to the atmosphere is equal to that of a 5-inch diameter bar weighing 1,000 pounds, or having a length of 12.7 feet and surface of 25 square feet in the case of bronze, or 65 square feet in the case of aluminum. The maximum surface exposed to oxidation in Fig. 1 (i. e., when the mould is half full) represents twice the area of one side of the ingot. Suppose the ingot to be a cube, weighing 1,000 pounds, the maximum surface exposed to oxidization would be 1.35 square feet, actually 18.5 times less than in Figs. 2 and 3. Now, as the metal in 2 and 3 is run into the mould at a much higher temperature than in Fig. 1, it oxidizes more rapidly and therefore injects considerably more than 18.5 times the quantity of oxide into the mass.




—FIG. 2.—

OLD METHOD OF POURING.

The cause of blow holes, skin faults, alumina and other oxides is now laid bare, and the prevention of the cause is illustrated in Fig. 1. Blow holes caused by air are prevented by the metal being allowed to settle while very hot, and therefore quite liquid, in the lined pocket. When all air bubbles have had ample time to rise, the pocket and mould are slowly tilted, and the metal is transferred gradually into the mould without giving a second chance for bubbles to enter.




—FIG. 3.—

OLD METHOD OF POURING.

Bubbles caused by gas being given off from some foreign matter which has been injected into the mass while being poured into the pocket, and burnt inside the mass, have also ample time to rise, and any dust which may fall or be blown on to the surface after rests on the surface with a minimum inconvenience, as it will be seen that the surface of the metal in the pocket forms a small portion of the surface of the ingot and the entire head. As stated above the metal is run into the pocket as hot as possible and transferred to the mould as cool as possible. This allows it to be carefully cleaned, and the moulds to be designed a minimum thickness being therefore lighter to handle and cheaper to produce. At the same time this gives the required chill, and does not become too hot even when used for repeated operations in quick succession.

In Fig. 1 it will be seen that no part of the mould which has been once covered is ever uncovered, and therefore no skin faults are produced on the ingot, and sections can be cast, thin in comparison with their width and length. This point is interesting from the point of view of sheet production.

The alumina, so abundant in bronze ingots cast by the old process (even after the metal has been recast an infinite number of times and gone through all sorts of deoxidizing treatments) is entirely eliminated in Fig. 1 owing to reduction of exposed surface, and by casting the ingot in such a manner that the surface in question is transferred to the head of the ingot. This oxide of aluminum, a form of emery, hitherto rendered the metal not only useless for tubeing, wire, etc., but for anti-friction purposes. Now, however, that it has been eliminated the metal has bearing properties equal to some of the best anti-friction metals.

Other oxides which form separations between the crystal zones and thereby reduce the ultimate strength of the metal, are eliminated in the same manner.

Having now dispensed with the other common difficulties, the question of feeder heads or dozzles can be considered. In Figs. 2 and 3 the dozzle is manipulated and put in place while white hot, in which state it is extremely difficult and delicate to handle, and the pre-

heating is anything but economical, where as in Fig. 1 the dozzle is just sufficiently heated to insure its being perfectly dry. It is therefore easy to handle and is placed in position before the mould is filled. It will be noticed that it is afterwards automatically heated by the molten mass when the casting is taking place, and in practice keeps the feeder head molten for a considerable period longer than is actually necessary to feed the ingot, which it must be remembered has been cast at a temperature much lower than Figs. 2 and 3, and therefore requires correspondingly less feeding. This also entirely does away with skilled labor and all the disadvantages attached to it. In Figs. 2 and 3 a man is obliged to stand by and feed the dozzle as the ingot empties it, which operation is likely to be irregularly performed even though a high price is paid for it. In Fig. 1 the correct weight of metal to fill the mould and dozzle is run in a single operation.

Opinions are very much divided as to the most efficient method of running copper ingots. Some engineers, well placed to have all practical as well as theoretical details at hand, emphasize the necessity of agitating the molten metal as much as possible, with a view to burning the suspended sulphur, but this is producing an expensive cure rather than preventing the cause.

The writer has no experience of steel ingot casting, and would be interested to know if this method in a modified form could not be applied to crucible steels, in the manufacture of which there may be certain difficulties common in aluminum bronzes.

## WATER JAPAN*

A Stable Emulsion of Japan in Water.

By Wheeler P. Davey, Research Laboratory, General Electric Company

The fire risk attendant upon the use of inflammable solvents in the usual baking japan process led to the development of the water japan process. Water japan is a stable *emulsion* of japan base in water. Dr. Davey describes below the characteristics of this emulsion and the electric dip and the hot dip methods of applying it.—Editor, General Electric Review.

Baking japan, as it is ordinarily used in industry, consists of a "base" and a "solvent." The base contains one or more of the various asphalts, together with one or more siccative oils such as linseed oil or china-wood oil. The finished base is a tough rubbery mass which looks much like tar. It is the office of the solvent to dilute this base to a liquid, so that the metal may be easily coated with the desired amount of japan base. The solvents in common use are naphtha, kerosene and similar products. The use of such solvents entails a considerable fire risk, especially in the oven in which the japanned metal is baked. It was to eliminate this fire risk that "water japan" was developed.

Water japan consists of an emulsion of japan base in water. By this is meant that an enormous number of tiny ultra-microscopic globules of japan base float around in the water japan in much the same way that globules of butter fat swim around in ordinary sweet cream. The diameter of the globules is about 0.00001 inch. The emulsion is permanent, showing no tendency to settle out even after several months. It may be strained in the same manner as ordinary japan and, if desired, may be cleaned in a commercial clarifier of proper design. Since water is the "solvent," the losses due to evaporation are negligible, especially if the japan is kept cool. Scum will not form on the surface if the temperature of the liquid is kept below 100 deg. F. (38 deg. C.). After the water japan is baked, it is quite insoluble in water. The range of concentration which may be successfully used is very great, so that little supervision is required.

The viscosity of water japan is much less than that of the same base dissolved in kerosene or similar solvents. There is a possibility that, in the future, methods may be worked out by which the viscosity of water japan will be so adjusted that metal may be coated with water japan by dipping in the same way as with ordinary japan. However, the advantages of employing certain entirely different methods of applying the japan base to metal before baking seemed great enough to justify their development. They all have this feature in common—the japan base is deposited on the metal in a solvent-free condition. In this way, the behavior of the japan in the baking oven depends entirely on the characteristics of the japan base employed so that "secondary drip" is rendered negligible. These methods of applying water japan are given in detail below.

*From General Electric Review.

### THE ELECTRIC DIP.

The electric-dip method is adapted to small odd jobs of japanning rather than to quantity production. The water japan is put in an iron tank which is connected to the negative terminal of a direct-current circuit. The metal to be coated is connected to the positive terminal of the circuit. Since the globules of base in the water japan carry negative charges, the base will be attracted to the positively charged metal. The water is left behind, so that the metal is covered with a thin film of japan base, free from solvent. This film possesses some insulating properties even before baking, so that, as soon as the most exposed portions of the metal are coated, deposition starts in whatever holes and recesses may still be bare. The thickness of the deposit of base depends upon the product of the current-density and the time. Using a 125-volt circuit, the time required for a satisfactory coat is about 2½ seconds. In using the electric-dip method no special voltage is necessary. The work is connected directly across a direct-current line of high current carrying capacity without series resistance, so that the current flowing will be proportional to the area to be covered. The current on 125 volts will average about 0.8 ampere per square inch of surface to be covered. Due to the polarization effect, the current is higher at the instant the circuit is closed than at the moment of breaking. Time is most conveniently measured by means of a time switch connected to a relay. Accidental short circuits are prevented by a wooden grating on the sides and bottom of the tank. It is absolutely necessary that the surfaces of the metal to be coated be free from grease or other insulating material. During the time the japan base is being deposited, the metal should be submerged at least 2 inches below the surface of the water japan so as to allow it to be in approximately uniform electric field. Only one coat can be given by the electric-dip process as baked water japan acts as an insulator.

### THE HOT DIP

The hot-dip method is adapted to work with large quantities of small castings, punchings, etc., where it is essential that the labor cost be kept at a minimum. The metal to be japanned is placed in wire baskets and heated in an oven to a temperature of about 500 deg. F. (260 deg. C.). It is then cooled to about 400 deg. F. (200

deg. C.) and quickly plunged into the cold water japan. The japan base leaves the water and collects in a film on the surface of the metal. After the basket has remained in the water japan about ten seconds it is removed, drained for about 30 seconds, and placed in the baking oven, where it is baked in the usual manner. After baking, the basket is emptied into storage boxes. The baskets may be handled entirely by chain-falls or an air-hoist, so that upwards of 100 pounds of metal can be handled at once. Except when the pieces of metal to be coated are very small, reinforced baskets of ½-inch mesh wire screen are suitable. The metal is often shoveled directly into these baskets, especially if it is in the form of small irregular castings or punchings. In some cases, however, it is advantageous to pack the contents of the baskets systematically, either for the sake of getting in a greater number of large pieces or of determining where the points of contact from piece to piece shall be. There is no handling of the individual pieces from the time the basket is filled until it is finally emptied into the storage box. Preheating was originally developed as a cheap method of cleaning grease and oil from metal before japanning. It is especially useful on steel punchings, and on brass, copper and aluminum. Most grease of this sort is thoroughly cleaned off if the metal is heated to a temperature of 500 deg. F. (260 deg. C.) and kept there for a half hour. It was soon found that if this preheated metal was quickly plunged into water japan while still hot (250 to 400 deg. F.) that the heat in the metal had the same effect as the electricity in the electric-dip process in causing the japan base to adhere to the metal leaving the water behind. There was this additional advantage, that the surface of japan base immediately in contact with the metal started to bake from the residual heat of the metal, thus tending to insure good adhesion.

In case the metal to be coated has flat faces, there is a chance that two flat faces may lie together so that neither of them would get a satisfactory coat. This may easily be obviated by dumping the hot contents of the basket into the water japan, catching the metal in another basket below.

Due to the fact that there is practically no "secondary drip" with water japan the scars due to the contact of one piece with the edge of another in the basket are negligible. After baking, the baskets are usually emptied by turning them upside down. In case it is desired to give more than one coat of japan, the basket is taken out hot from the baking oven and at once dipped. It is then put back to be rebaked.

### CONCLUSION

In using ordinary japan, the thickness of coat depends upon the viscosity of the japan. This is measured in terms of its density as shown by a hydrometer. In none of the foregoing methods described for using water japan has the viscosity been an important factor. Instead, the emphasis is placed upon the concentration of japan base in the liquid. Even here, the limits are quite wide for the maximum permissible concentration is about twice the minimum. For cenvenience, a concentration meter has been designed by which the concentration may be easily measured directly. The base is coagulated from a known amount of water japan by a solution of $Fe\ Cl_2$, $Ca\ Cl_2$, or a mixture of them. The lump of base is freed from water inclusions and is then weighed. This apparatus is very compact and requires as little supervision as the water japan itself.

It is a pleasure to express my appreciation to Buell Smith for his first work on the hotdip method and to H. Chislet for his work in extending this process to its present state of development.

### ANNEALING EQUIPMENT.

Q.—We are not familiar with the conditions surrounding the use of annealing equipment in a brass plant and before giving our advice would like to secure information on the subject. We are writing to you because of the fact that your journal covers this field very thoroughly and hope that if you have not the information available you can refer us to someone who can post us on this subject.

What material is now being used in the manufacture of annealing equipment for brass pans?

What are the dimensions covering equipment manufactured from sheets or plates? (Provide sketch or drawing if possible).

How is the equipment used, i.e., subjected to direct-flame or heated otherwise?

How cooled, etc.?

To what temperature is the equipment subjected and how long does it remain under heat?

What is the life secured from present material? Express in number of times under heat.

What are the deteriorating agencies or causes of destruction?

How is material placed on annealing equipment for annealing purposes, i.e. piled to prevent circulation of flame or placed separately.

It is the desire of this company thoroughly to inform themselves as to the uses to which our material is to be placed in service before making any recommendations and any aid you may give us along this particular line will be greatly appreciated.

A.—The materials now most extensively used in the manufacture of these pans is a low carbon steel.

In reference to your second question we are unable at the present to furnish you with a sketch of the pan generally used. These pans, however, are about five feet wide and upward of twelve feet long, and are merely sheets generally ⅛ of an inch thick, reinforced at each end with a steel bar around which the hook for pulling in and out of the furnace engages. The pans are subjected to both direct and indirect heating, according to whether an under or over fired annealing furnace is employed. The pans are cooled both by means of air and water. The highest temperature to which the pans are heated is from 1400 to 1600 degrees Fahr. and it remains in this temperature from one hour to an hour and a half. We have no definite information relating to the question regarding the life of pans. The agency which causes the deterioration and ultimate destruction of the pan is scaling. The material is usually piled on the annealing pans for treatment. L. J. K.

### U. S. MINING MEDAL GIVEN TO SCHNEIDER, "SCHWAB OF FRANCE."

The gold medal of the Mining and Metallurgical Society of America was conferred upon Charles Eugene Schneider, head of the Creusot Steel Works and chairman of the French Economic Mission which attended the recent Foreign Trade Conference at Atlantic City.

Mr. Schneider, who has been called the Charles M. Schwab of France, was greeted at the dinner by Charles M. Schwab, of America, as "the leader of the steel industry." Mr. Schwab said the steel industry in this country virtually was back on a peace-time basis. The need of the hour and of the future, he said, was "the forging of guns of public opinion and justice by which the world will be won."

Q. How to pickle rolled brass after annealing?
A. Ten per cent sulphuric acid pickle.

The Monthly Review. A. E. S.

# MAGNESIUM AS A SCAVENGER OF METALS

ADVANTAGE OF MAGNESIUM OVER OTHER DEOXIDIZERS.

WRITTEN FOR THE METAL INDUSTRY BY J. T. ROONEY

Magnesium, because of its chemical properties, possesses many peculiar advantages over any other substance that may be employed as a scavenger of metals in the foundry.

Whatever the type of furnace used: tapping, tilting, or pit, or source of heat employed: charcoal, coke, oil, gas, or electricity, it is impossible to avoid contamination of the melted metals with air or products of combustion of the fuel, and the impurities thus introduced often impart to the castings very objectionable properties.

One of the commonest defects in metal castings is the presence of blowholes or cavities, which may be either microscopic in size or very large. Blowholes or porosity in the metal are due to the absorption of gases by the molten metal. The solubility of gases in metals increases with the temperature, a very great and sudden increase occurring at the point of fusion of the metal, so that the solubility of gases is many times greater in metals in the molten than in the solid state. This explains the sudden expulsion of absorbed gases from metals while freezing in the molds and the presence of cavities in the castings filled with gas liberated from solution but unable to free itself quickly enough from the rapidly solidifying metal.

The gases which ordinarily come in contact with metals during the course of melting are oxygen and nitrogen from the air, together with water vapor, carbon dioxide, carbon monoxide, hydrogen, and sulphur dioxide from the combustion of fuels.

Some metals favor the absorption of certain gases while some have a preference for others. In brass furnace practice, the most troublesome gases are oxygen and sulphur dioxide. Copper eagerly absorbs oxygen forming cuprous oxide which dissolves in the molten metal to form a homogeneous solution but releases most of the oxygen on freezing. Nickel behaves in a similar manner to copper. Sulphur dioxide is also very soluble in molten copper but is practically insoluble in the solid metal, the gas which is released when the metal freezes being a frequent source of porosity in copper and its alloys. Hydrogen is dissolved by molten copper, nickel and iron but not by zinc, lead, tin, bismuth, or antimony. The solubility of hydrogen in copper is increased by alloying with nickel and diminished by alloying with tin, aluminum or magnesium.

Some metals combine with certain gases forming compounds which are insoluble in the molten metal and which float on the top in the form of a scum or dross which can be easily skimmed off; the oxidation of molten lead is a familiar example. Occasionally, however, compounds are formed which are not only insoluble but separate with difficulty and are subsequently a source of weakness in the metal. Bronzes sometimes absorb oxygen during melting to form the higher oxide of tin, which is clearly visible under the microscope as well-formed crystals entangled in the mass and greatly impairing its strength.

The simplest and most economical method for the elimination of impurities from molten metals which cause porosity or weakness in the castings is by the addition of a substance which combines chemically with the impurities forming compounds which separate easily from the metal before it is poured into the molds. There are many such substances recommended for this purpose, including silicon, aluminum, magnesium, manganese, phosphorus, boron suboxide, titanium, etc., and all are more or less effective. It is unfortunate, however, that considerable uncertainty must exist as to the exact amount of deoxidizer required in each instance and it is therefore customary to use a definite amount for each class of material to be treated which should in all probability be sufficient for complete removal of the impurities without leaving such an excess alloyed with the metal that would seriously affect the properties of the latter. Thus, phosphorus in the form of a ten per cent phosphor-copper alloy is often added to copper to deoxidize it but an excess of more than one-tenth-of-one per cent phosphorus remaining in the metal will form the hard copper phosphide, $Cu_3P$, which causes extreme brittleness. The improvement in the quality of gunmetal containing a little phosphorus is mainly due to the removal of oxides and the same effect can be attained by the use of other deoxidizers.

The fact that magnesium will reduce most other metals, including its rival scavengers, from their oxides to the metallic state is proof of its greater chemical affinity for oxygen. At a red heat magnesium attacks all the gases, with the possible exception of hydrogen, that may come in contact with metals during melting and will, in addition, eliminate stannic and other harmful oxides which have a tendency to remain in the castings.

The amount of magnesium that is ordinarily required for deoxidizing metals is so small that it is most convenient to use the metal in the form of a ten per cent alloy so that the addition of one pound per hundred of the metal to be treated is equivalent to one-tenth-of-one per cent magnesium. A ten per cent magnesium alloy with copper is to be recommended for treating brasses and other alloys of copper. It is easily made by holding with a pair of tongs for a few minutes a piece of magnesium of required weight below the surface of a crucible of molten copper with which the magnesium quickly alloys, and the metal can then be cast into sticks.

These sticks are quite brittle and can easily be broken to any size with a hammer.

When used as deoxidizer, magnesium is best added in the crucible or ladle a few minutes before pouring; the heat of reaction with the impurities will usually increase the heat of the metal to a considerable extent. The addition of one-tenth-of-one per cent magnesium will generally be more than sufficient for the complete deoxidation of aluminum, copper, nickel, zinc, brasses, bronzes, monel metal, etc. In the case of very impure or scrap metals two-tenths-of-one per cent might be used with advantage.

When a metal such as copper is to be employed for conducting electricity, the highest purity is required and since alloying with other metals decreases the conductivity, magnesium is no exception to the rule, and it is advisable to use only about one-half the quantity which would otherwise be taken for deoxidation.

Magnesium in small amounts, even up to one or two per cent enters into solid solution with all the common metals without the formation of brittle compounds and an excess of this scavenger remaining in the metal is the least harmful of any and may even in some cases, be greatly beneficial.

Porosity in castings is the most serious difficulty in the manufacture of hydraulic fittings which condition is readily remedied when the metal is deoxidized with magnesium, by use of which it is now possible, also, to produce these fittings from metals heretofore considered unsuitable for the purpose.

# BRITISH BRASSWORKERS' VISIT TO GERMANY

## Information Gained and New Ideas for Manufacturers in Other Countries.

During the last two weeks in July a party of brass manufacturers from Birmingham and Manchester paid a visit to the portions of Germany now in British occupation, for the purpose of inspecting the principal brass factories. The visit was undertaken on the invitation of the Overseas Department of the Board of Trade, and the party returned on August 4 The visitors comprised Mr. Howard Wilson (Clews & Sons, Ltd.), Mr. Neville Sperryn (Sperryns, Ltd.), Mr. E. P. Showell (Showell & Sons, Ltd.), Mr. Howard Smith (Smith & Davis, Ltd.), all of Birmingham, and two representatives of the United Brassfounders, Mr. F. Newman (Woodchester) and Mr. Howard (Manchester). It was the wish of the deputation to be accompanied by Mr. J. W. Madeley, the Secretary of the Brassfounders' Association, but other duties prevented his joining the party. It was, however, thoroughly representative of the principal branches of the British brass trade.

The visitors were received in a friendly spirit, and all information was quite frankly placed at their disposal. There are, of course, very large brass manufacturing concerns in other areas, particularly in the neighborhood of Berlin, but the visitors consider that they were able to obtain a very good idea of the main lines of German manufacture.

The following report has been subsequently presented, and it is understood will be circulated to every member of the Brassfounders' Association. Some delay in the publication has been occasioned owing to the necessity to submit it to the Government Department before sending it out to the trade.

### Report on Visit to German Works.

In presenting the report upon the Brass Mission in the occupied districts of Germany it has not been considered necessary to name the firms visited individually, nor to give in detail any particular impressions received or observations made upon any specific firms.

The visit was undertaken with the feeling that the German manufacturer was well in front of us in manufacturing methods which had in the past put him in the position to undersell us in foreign markets, and the impression received after the Mission had completed its work was that the main advantage which the German had in the past over the English manufacturer was due to the smaller variety of articles produced by each manufacturer, namely, greater concentration on output, resulting, of course, in a larger turnover, combined with that careful attention to the manufacture which is a characteristic of the German, from the head to the humblest employee in the works.

The casting methods appear to offer the greatest divergence from the English system, and while both hand and machine moulding appears to be employed very generally, the following differences were particularly noticed. It appears to be the common practice in all brass foundries to put the moulds in an oven as soon as they are made, and leave them there until the next day, such moulds being taken from the oven the next morning and poured during the day, and the oven again refilled for restoking up for drying a new lot the following night. Both pit furnaces and tilting furnaces are in evidence, several Bessemer type tilting furnaces made of iron and lined with brick being noticed, this system avoiding the use of crucibles except as a medium for carrying the metal from the furnace to the moulds, in some cases the carrying pots being of iron. The moulds, when cored up, are placed on top of each other into a pile three or four feet high, and the whole bolted together, after which they were laid on end for pouring in the usual way. It also seems a common practice for the castings to be cast off the ridges when cold by means of a sprue cutting machine. In one works, where hand moulding was in progress, in place of using mallets, a heavy metal ball about 7 inches in diameter, and weighing ½ cwt., was rolled all over the mould in order to compress the sand, and this method would possibly ensure more regular pressure for work which does not vary too considerably in height. It was also noticed in several works that loose locating pegs were inserted in the sand of the mould to assist in the accuracy with which the moulds were matched up.

A visit was paid to the works of a manufacturer of extruded rod, both brass, copper and aluminum, also hollow rods. He also manufactured large quantities of hot brass stampings, the work being of a particularly interesting character, such as watercock heads, valves, crutches, etc., and the opinion held was that this work showed a distinct advance upon the average work of the Birmingham district.

A visit was made to a large firm of metal rollers. The plant was in perfect condition, and the sheet metal produced was of the very finest quality. We consider that a visit to a works of this character would be of considerable interest to the metal rollers of Birmingham.

It would appear that greater attention is paid to the production of sheet brass than obtains in Great Britain, the utmost care being taken in the removal, both by chemical and mechanical processes, of oxides and foreign matter from the surface of the metal before rolling, thus resulting in a much better and finer product in every way. It appeared, also, that the slitting of sheet brass was done very much better than is generally the case in Great Britain, and much greater accuracy and cleaner-cut edges are obtained: a minimum of waste in the working up is therefore possible.

A visit was paid to one of the largest makers in Germany of semi-rotary pumps, and who combine, also, the manufacture of sluice valves, horizontal vacuum pumps, etc. The works are large, and at present employ 2,000 hands; pre-war they employed 3,000, and during the war 4,000 to 5,000.

The iron foundry is very large and well planned. They use various types of moulding machines, hand-rammed, pneumatic and hydraulic, to suit various jobs. Their best machine is hydraulic, and they are making flat covers, etc., on these, and each machine turns out about 100 complete boxes per day. Their iron castings are clean, good-looking, and of easy machining qualities. They blow once per day. Their cupola arrangements are good, but nothing specially different from good English practice.

The brass foundry is a good, roomy place, the melting and pouring being carried on in a separate room to the moulding.

They appeared to be using odd scrap, which is melted in large tilting furnaces of iron, with firebrick lining, both coke and oil fired, with forced draught.

The use of automatic machines was greatly in evidence, but, generally speaking, the speed at which they were running was slow. The internal machining of sluice valves was effected by a double-headed facing machine, each head being set at the same angle and operating simultaneously.

It was not found necessary to test more than 10 per cent. of the pumps, owing to the perfect casting and machining thereon.

Throughout the tour it was generally observed that a larger proportion of young male labor was employed than is the custom in Birmingham, and they appeared to take great interest in their work, which was very efficient. Up to the age of 18 these youths are compelled to attend continuation schools for three nights per week, and do not qualify for any adult trades union conditions until the age of 24 years.

None of the manufacturers visited were working at their full normal output owing to shortage of labor, and in some cases to shortage of material, but we would again like to emphasize the fact mentioned in our opening remarks, namely, that one of the most noticeable facts was the absence of multiplicity of patterns, which prevents the Birmingham manufacturer from concentrating his output in such a way that the turnover can be increased with less supervision.

It should be borne in mind that the German has a considerable advantage over the British manufacturer at the present time in the fact that the rate of exchange is such that to the export buyer the prices are exceedingly cheap, and until this rate of exchange becomes normal, he will be able to outbid the British manufacturer for the export trade for all those articles where the larger proportion of the labor and material is produced in his country.

It is practically impossible in a report such as this to describe in detail all the points which might be of interest to individual manufacturers. The members of the Mission, through Mr. J. W. Madeley, will be prepared to discuss, as far as possible, any points arising out of this report.

### Interview with Mr. Madeley.

Mr. J. W. Madeley was good enough to supplement this report in an interview with our Birmingham representative. The hours of labor, Mr. Madeley states, are 48 hours per week, and the remuneration fairly compares with that prevailing in British works, though it must be remembered that as the mark has now only one-fourth of its nominal value of 1s., the German workpeople must be suffering considerable hardship in view of the tremendously high price of necessaries, butter, for example, being 12s. 6d. per pound, eggs 1s. 6d. each, while a suit of clothes costs £39 15s. As a rule, the day's work finishes at about half-past four, the object of this arrangement being to allow the youths under 18 to attend the continuation schools specially provided, and at which the attendance is compulsory. In this respect, Mr. Madeley considers the German system greatly superior to the voluntary system prevailing in this country. For many years past the Birmingham manufacturers have been in the habit of paying the fees of the boys attending the technical classes, but these facilities have only been taken advantage of to a very limited extent, the boys not being sufficiently interested to make the necessary sacrifice. Undoubtedly, in the future, such attendance should be made compulsory.

The German factories work on the single-shift system. At present they have not the requisite labor to operate a night shift. In view of the scarcity of labor, the repatriation of German prisoners which has now commenced will be greatly welcomed by German manufacturers, who have been badly wanting their men for a long time past. Any number of situations could be found for them on their return.

The deputation saw many things which could be adopted very widely in the Birmingham workshops, particularly in regard to the methods of casting and of rolling. It will be seen that in the report the deputation suggest visits by metal rollers for the purpose of a personal inspection. This suggestion has already been promptly taken up, and two leading metal rollers of Birmingham are making arrangements for a visit at an early date.

With regard to the education of youths, the early closing hours of the works has for one of its most important objects the furnishing of an opportunity to the youths to attend the continuation classes already mentioned. But the German manufacturer has the further advantage that in regard to general education the youths there are much better furnished than those in this country.

The matter is of very great importance in view of the keen competition between this country and Germany, which was a formidable element before the war, and has now shown signs of being renewed. Owing to the very low value of the German mark, it is quite impossible for the British manufacturer to compete with the Germans in the neutral markets. On the other hand, the rate gives this country an immense advantage in buying from Germany, inasmuch as the purchaser gets the value of 80 marks for a purchase of 20 marks. But Germany cannot buy from us until the rate of exchange becomes more normal. Neutral markets, however, are certain to open up a huge trade with Germany, solely on the question of price. It will be self-evident that if British manufacturers can take advantage of the purchase of partly-manufactured goods from Germany, they must derive an immense advantage, and this is a matter of very great interest from the labor point of view.

With regard to the slow running of the German automatic machines mentioned in the report, this was a matter which rather puzzled the visitors. It is a generally accepted axiom that fast-running machines are highly economical because of the great effect on production, while they do not involve any deterioration in quality. This seems to be a matter in which German practice is behind that of this country. The goods manufactured left nothing to be desired in the matter of quality, and on this ground German competition will have to be reckoned with.

It will be noted that the Germans employ a large number of youths in proportion to those employed in Birmingham. The Birmingham manufacturers could find room for many more youths if they could be obtained. There are a great number of operations in which youths could be very satisfactorily employed.

Prior to the war, enormous quantities of German stuff were met in foreign countries, and considerable consignments were sent to this country. This, of course, was suspended during the war, but the stuff is now coming in again.

## PICKLING AND BRIGHT DIPPING.*

Brought Out for Discussion by the Educational Committee at the Chicago Branch Meeting A. E. S. October 11, 1919.

Q. How to pickle cast iron?

A. A good pickle for cast iron is muriatic acid in proportion 5-1 to 10-1.

A most satisfactory pickle is composed of five parts sulphuric acid, one part hydrofluoric acid and double the amount of water. The work should be pickled anywhere from 10 to 40 minutes and scratch brushed.

Q. How to pickle drop forgings.

A. Twenty-five per cent muriatic acid solution.

Nitre cake dissolved in hot water also makes a good pickle for drop forgings.

Q. How to pickle hot rolled steel?

A. Muriatic acid.

*The *Monthly Review*, A. E. S.

# PRODUCTION, COST AND PROFIT CONTROL

ADMINISTRATION AND MANAGEMENT OF NON-FERROUS FOUNDRIES
WRITTEN FOR THE METAL INDUSTRY BY WALTER GLENN SCOTT

General summaries of the faults of management of the average non-ferrous foundry were given in the September issue of METAL INDUSTRY. These faults were described, as they were related to Cost, Production and Profit Control. In addition, outline was made of advantages secured through a method of graphic management which has been installed in several non-ferrous and gray iron foundries.

It was related that the specific applications of graphic management under discussion were for purpose of control of production; and costs and profits as well. Machines, benches, floors, men, in fact any place where operations were performed on product, were the elements of units controlled. Each in itself is a unit of investment of the total organization.

In maintaining certain hourly rates of production, with overhead and wage rates also on a time rate basis, it was, of course, possible to predetermine costs of production. If estimates were based on production rates and we maintained these rates, evidently these estimates were realized as the actual costs.

Also it was stated that profits, asked as compensation for productive efforts, should be so much per hour of time applied by machines, benches, floors, and other working places. We might state that the hourly profit earning capacities of different classes of production units are qualified by the investment, depreciation, supervision and other elements necessary to maintain them in a condition of productivity. The hazards, the variables, the percentage of operating time which can, in general be used, also qualify the profits per hour which should be asked.

It is opportune at this time to repeat that in the specific application of graphic management under discussion, the following principal mechanisms were more or less closely related, namely:

1. Graphic Control Boards, each giving suitable space for controlling 50 individual production units, or classes of work, and the men who operate them. Inasmuch as they are the centralized means of control, they are located in the central planning or production department.

2. Dispatch or Job Holders, for display of the "Job Working On" and the "Next Job to Do," for those production units definitely localized and which worker has no occasion to leave. They are really the branches of the Central Planning Department which are located in the shops, for convenience and direct contact with workers.

3. Dispatch or Job Boards, for display of "Job Working On" and the "Next Job to Do," for those workers who are not at all times located at one place during the performance of their duties. They are also located in the shops in contact with workers.

4. Dispatch, or Tool Racks, for the laying out of the miscellaneous patterns, gates, plates, core boxes, chills, or inserts of the "Next Jobs to Do," so they may be ready and may be definitely located when wanted.

5. Furnace Dispatch Boards, to indicate to furnace men the times when it will be necessary to have specific metal ready to pour specific molds.

We will now describe in some detail the operation, functions and inter-relation of the five principal mechanisms of control. Graphical scales, used in graphical management, consist generally of only one co-ordinant. In the installations, being described, unit length on a graphical scale represents the standard production quantity which, it is estimated, can be done per hour; that is, each hour's time as indicated on the control board represents not only the hour, but the quantity of work which it is estimated can be done in that hour.

Control Boards are the means of display of graphic scales; that is, production schedules. They are really maps of production units of shops and their capacities for doing work. Each production unit stands by itself and relations between operations on all production units are established on a time basis, because the graphic scale of time is made the same for all working places.

In fact, it is possible to know many things in regard to each production unit. This information is automatically stated in terms of standard rates of production per unit of time, and by relations brought about by all working places being controlled by the same time scale. In addition, there were many pertinent details in connection with work, which is being done, which are written on the forms or cards which carry the graphical scale. Principal information available on a Control Board is as follows:

1. The hours of work scheduled ahead.
2. The hours of work ahead, for which material is available.
3. The accomplishment to date in hours' work; that is, at the scheduled standard rates of production.
4. The hours of work spoiled on previous operations.
5. The hours of work spoiled at production unit in question.
6. The times at which deliveries of material must be made from preceding operations or production units.
7. The times at which deliveries of material must be made to next operations or production units.
8. The production unit, or place, at which the previous operation is done, or the source of routing.
9. The production unit or place at which next operation is done, or next place of routing.
10. The shop order number.
11. The order quantity on work scheduled.
12. The descriptive names or numbers of parts, or patterns, and the standard productions per unit of time and the operation, or operations, done at the one setting.

Areas on Control Boards, given over to each production unit, are long rectangular spaces extending across the face of the board; that is, horizontally. For convenience, the depths of these spaces, or the short dimension of the rectangle, are generally about 1½ inches and its length is most usually 50 inches. With each hour represented by 2-10 inches, it is possible to display on the board at all times 250 hours of scheduled work; that is, approximately a month's work ahead.

Graphical scales on Control Boards are of such a size that 50 production units, or classes of operations, are handled on each board face. As has been mentioned before, Workers' Job and Time Reports; that is, the Job Cards on which a graphical scale has been incorporated, are used for posting scheduled work.

The mechanism of the board for holding the Job Cards, that is, for posting scheduled work, consists of over-lapping sheet metal pockets suitably arranged so that the upper portions of Job Tickets are exposed.

The exposed portion of Job and Time Reports display the graphical scale and the most pertinent data, such as order number, department and working place, worker's

number, helper's number, part number, date, sequence of tickets, standard hourly production, the operation and the routing.

We have mentioned above that graphical scales, extending across the face of the boards, were 50 inches long under general conditions and each hour was represented by 2-10 inch. This makes it possible to display on the board 250 hours work ahead at all times.

For convenience in time relationships, the 250 hours are divided into five equal 50 hour spaces by four vertical black rubber cords of about 3-16 inch section which extend from bottom to top of the boards. Each 50 hour space is in turn divided into 10 hour spaces by black rubber cords of about 1-16 inch section. The contrast of black cords with white surface of posted Job Tickets gives an easy and quick method of visualizing the amount of work ahead of each production unit or working place.

At the top of the Board, a date scale is arranged for the current month, as well as the progressing days of the following month, as soon as available space comes about, due to the passing of time of the current month. Each working day is posted in a metal date slide by a strip of card board, whose length indicates the regular number of working hours each given day period.

As each day progresses, a red rubber cord of about 3-16 inch section and which also extends from the bottom to the top of the Board, is moved along to the place indicated graphically by the end of the last completed working day. Work finished ahead of the red cord, is work ahead of schedule and work unfinished; behind the red cord, is work behind schedule. Comparison is made possible by red date line and the black 50 and 10 hour period lines giving all times relationships required.

Each production unit or class of work is identified by suitable strips of card board placed in metal slides at both right and left hand of the spaces delegated to the graphical scheduling of machines, benches, floors, and other working places. These identifications, or titling cards, give the number of production unit, its department location and its descriptive name, range, and specialty. In this way, we were able to quickly identify and co-ordinate our reasonings with regard to the entire outlay of working places.

Of course, against each production unit or class of operations, certain workers or operators must be scheduled. It is of real importance to know where each employee may work as well as what he does. This information is supplied by 1 inch round, yellow tags, giving each employee's clock number as well as the symbol of the general class of operations each are most skilled in doing. These employee identification tags are located on suitable pegs or hooks opposite the machine, bench, floor, or other operating place they may handle.

Only those employees, on the job and working, are placed on Control Boards. Where an employee is absent for any reason, is ill, is on vacation or away on company business, his tag is placed on the absent employee board, under proper designation. Energetic follow-up of labor requirements is of great importance to an adequate production control, particularly during these times of stress in labor conditions.

On the left-hand edge of the Control Board opposite each production unit, are arranged two distribution pockets. Current finished job and time reports are filed in the lower of each pair of pockets, located opposite the production unit where the work was performed. Job reports are filed in these pockets directly after collecting from rounds made in shops by Dispatchers. Before filing, however, the Dispatcher makes all necessary compilations on these reports so that they will be ready at the time scheduled for making registration on progress records, graphic registrations on Control Board Scales and checking with employees' clock cards.

The upper of each pair of distribution pockets, opposite every production unit, is utilized for the purpose of holding production data standards for each production unit or working place. This as a matter of fact, is only for convenience and systematic reference with regard to what the given working place is best able to do and what it can accomplish per unit of time.

On the right-hand side of the Control Board, opposite each production unit, there are also distribution pockets. These are utilized for job and time reports in excess of those posted graphically on the Control Board face. They are held here, however, only temporarily for as space becomes available, they are transferred to the board and placed in proper sequence and co-relation.

It must be understood that these excess jobs, placed in right-hand distribution pockets, are also arranged in the sequence in which it is desired that the work be done. Jobs to be done first are in front and so on in proper order to the last job filed in the pocket.

In connection with anticipation and posting of irregularities, that is, things which cause interruption or rearranging of scheduled work or the efficient use of available productive capacities, a system of signal tags or indicators is used. These signal tags are of two colors, red, meaning actual interrupting conditions and green, conditions which it is anticipated may happen.

Red tags signal and indicate such hold-up conditions to the use of equipment as machine repairs, no orders for work, want of an operator, want of metal or material, waiting for patterns, and so on. Green tags signal and indicate conditions which it is anticipated may happen and which should be followed up energetically so that they may be warded off. They signal such conditions as the probability of insufficient metal capacity, flask, core box or pattern repairs necessary, chills and inserts getting low, and so on.

On some of the installations, of which this is a description, these tags were made 1½ inches in diameter and were held and posted on the graphical scales by suitable metal clips. They were placed on the time scale at the time of occurence of the condition or at some future time when it will be necessary to follow up carefully an anticipated irregularity.

Before we proceed further with an explanation of the operations of scheduling, follow-up and registration of progress on jobs scheduled on Control Boards against production units, it will be better to make a brief description of the other principal mechanisms mentioned in the foregoing part of this paper.

Our next vital factors are Dispatch or Job Holders and Boards. Dispatch or Job Holders are used for posting in plain sight, the "Jobs Working On" and the "Next Jobs to Do" in direct contact with the machines, benches, floors or other definitely localized production units where work is being done. Where the class of work is of a nature such that workers will not be always at the same place in the performance of their duties, it is desirable that group dispatch or job boards carry the "Jobs Working On" and the "Next Jobs to Do" tickets. It is easier to dispatch and register reports of such workers' accomplishments at some centralized place.

Dispatch or Job Holders and Boards not only perform the function of displaying "in plain sight" the "Jobs Being Worked On" and the "Next Jobs to Do" but they also control other important matters. The very fact that they are placed in intimate contact with the actual doing of the operations, makes them convenient places for display of these other matters.

In case of molding operations, dispatch or job holders furnish the means to signal the metal specifications to

which moulds are to be poured as well as the manner in which they are to be poured; that is, fast, medium or slowly and with hot, regular or cold metal. This is done with 2 inch yellow signal tags suitable displayed on the dispatch holder and which carry the desired information. For core making, cleaning and finishing, machining and other operations, we find many equivalent uses for these signalling devices.

Dispatch or Job Boards which take care of more general operations have no use for the above means of signalling important specifications or manner of controlling secondary operations. However, in common with unit dispatch or job holders, they do furnish a means for display of workers' and helpers' numbers as scheduled to handle each production unit or operation.

All operating employees have suitable 1½ inch yellow celluloid tags on which their clock numbers and the general classification of the operations they can perform are printed. They are required to hang these tags on dispatch or job holders and boards which control the place they work and the operation they perform. In this manner, it is easy to identify and keep tab on each employee's work. Above employee identification tags are also utilized for the additional purpose of identifying employees passing through employees' entrance at starting and quitting times of each day's or shift's operations. When they are absent, it is very evident the tag will not be hung up at the place they work.

The vital necessity of this definite and energetic control of labor in non-ferrous foundries exists because of the high material values used in these businesses, the class of help generally employed and, in some instances, the high labor turn-over. Identification tags are charged to each employee at a good value and the psychological effect of the obligation, both material and moral, assists much in holding workers to jobs.

## PLAN REPORTS AND RECORDS

SYSTEMATIZING FACTORY CHANGES AND DEVELOPMENTS

WRITTEN FOR THE METAL INDUSTRY BY METT MCKUNE

It is probably the experience of every factory manager and others connected with the plant who are in a position to know that a very large per cent of the plans for the betterment of conditions either fail altogether or are never carried out as originally planned. It is safe to say that seventy-five per cent of such plans die a natural death and of the remaining twenty-five per cent not five per cent are ever carried through to a successful issue.

The adoption of a plan has probably meant the employment of more help, the purchase of supplies or at the least has meant that someone has been assigned to carry out the plan who might have otherwise been employed at some other task. It has meant the expenditure of money that has been practically thrown away because of the failure to produce results and furthermore, the cause of the failure is not on record and if anyone were asked to give a reason for its failure, he would be unable to do so. So even the experience which might be of value is also lost and in a few years someone may suggest a similar plan or the revival of the original and secure its adoption with the chances that its fate will be the same. Such plans either originate in the mind of someone interested in the welfare of the concern or have been adopted by some other plant, from which the idea was secured. It is carefully considered by its promoter. He prepares all his arguments in favor of its adoption. The plan, when presented, seems to be worthy of adoption.

It will, of course, meet with opposition. There will be those who honestly see objections and there will be others who will oppose its adoption because the plan is not their own and who are not particularly anxious to have it adopted, or if it is, will not weep very much if proves to be another added to the already long list of dead plans.

The reason why such plans fail or are carried through successfully is of as much value as the results that have been obtained by carrying them through. The reasons are many but they are not difficult to understand. It may be that there has been little or no opposition to the plan, but that the person who has been assigned to carry it through has not been told enough about it to arouse his interest. He sees it only as a pet scheme of someone in whom he is not interested, or he may dislike the person and will carry on the work for a time, but little by little the matter is dropped and the result is another dead one. Or it may be that the plan is an excellent one in many ways but the officials fail to support it. The foremen see in it only an additional task and they have not had it explained to them. They have seen so many of such plans started and last a few months or at the most, a few years, and they, too, drop it.

The man in charge of the plan sees this. He was deeply interested in it at first but as he sees the plan weakening at one vital point and takes it up with the factory officials, he finds that they have some other plan in mind and while they may listen more or less (generally less) patiently, little or nothing is done. The result is that he becomes discouraged and the cemetery of dead plans receives another occupant. It is possible that a plan after a fair trial may be found to be unpractical or that the results obtained are not of sufficient value to make it worth while to continue it, but this is true only in some cases. A plan in order to secure adoption, in view of the opposition it is sure to meet when it is presented, must possess some merit.

When a plan is adopted it should be recorded. It has a certain definite object, which may and probably will, involve certain details. The record should have a place of its own either on cards prepared for such a purpose or on loose leafs; have a binder for preserving the original plan and for the modifications which have been made and for reports which are made of its progress. Such a record should state definitely the principal idea. It should also record as fully as necessary the details, in such a way that each can be considered separately.

Let us assume that the Cost Department has found that it is not receiving complete reports on the loss due to work damaged in process of manufacture and of the cost of refinishing work. This matter is taken up and the plan of securing more complete records is adopted. The record may be called Damaged and Refinished Work Plan. It would state that the plan had been adopted on a certain date, that the superintendent had been instructed to see that all departments forwarded to the proper place complete reports covering these points and that the Cost Department had been informed of this. Now up to this point everything is fine but we are just where we have been with so many perfectly good, healthy propositions.

It is necessary that someone who is interested and who has sufficient authority be informed as to the progress of the plan. If the number of these plans is sufficient to justify doing so, it would be well to have someone who can and will see that the plans are carried out have

this as his particular work. He would have, of course, the original plan in his keeping and all reports would be forwarded to him to be filed with the original plan, he to report to the manager the progress of affairs but the authority of the one to whom this work is assigned should be unquestioned, and it is only to relieve the busy factory manager of details that this is done at all. The reports in this instance would come from the Cost Department. They would be entered on a form which would cover all the details of the progress of the work of this department, each entered so that it could be considered separately, or it might have a separate form.

Such a report is a permanent record. It brings the matter to the attention of the administrative heads of the factory as no verbal report ever could and it puts it up squarely to the one making the report, for any misrepresentation of the facts would be brought to light through investigation.

Now for the results. The reports from the Cost Department show that the plan is working fairly well, not quite as satisfactorily as they would wish, but the conditions are much better than they were a year back. The superintendent has known that the reports were being forwarded and if they were unfavorable he would be called upon to explain the management, have the facts in such a way that they can quickly see the situation, so that if any discussion is necessary it will not be necessary to listen to a long string of arguments and explanations. The proposition is clean-cut, certain definite plans were adopted, you were instructed to carry them out, the reports show that you have done so. Let us assume that the reports show that the difficulties in the way of carrying out the plan as adopted were so great that it was decided to drop the plan. This is entered on the record which is kept. Although the plan has not been carried out successfully it is known why it failed and if the proposition is ever suggested again, or a similar plan is proposed it would be a deciding factor in its acceptance or rejection.

Another way, and it is planned that these reports and records include these details, is like the procedure when certain changes are made in the construction of an article. For instance, a lamp has been finished in brushed brass, the shells are burnished but it has been thought necessary to send the lamp to the buffing room for a cut-down. It is decided that this is unnecessary, thus saving the cost of this operation and putting the lamp through the brush brass finish on the burnished surface. A record would be made of this change. The superintendent and Cost Department would be informed of the change in the process of finish and the Cost Department would report, of course, the progress of the plan. It is not intended that such reports continue indefinitely when the change has been made in the factory, and the records in the Cost Department should show that the change has been made. A single report covering this item is sufficient. If, however, later records should show that the lamps were being sent to the buffing room, the matter would be reported. This is a simple illustration. Such changes are frequently more numerous and far-reaching. The records would show all changes to be made and the reports, that the changes had been made.

## POLISHING WHEELS

### A Short History of Their Development

Written for The Metal Industry by S. A. Cochell, Polishing Room Foreman, Michigan Stove Company, Detroit, Mich.

There have been very few changes in the last thirty years on polishing wheels. They have been made of the same material and in the same old way. Whether this has been the fault of the manufacturers or the men who use them is a difficult question.

Wheels have been made of wood, leather, walrus hide, canvas, felt, paper, sheep skin and the common circular sewed buff sections. All of the materials used in their manufacture have advanced in price year after year and at the present time they are almost the most expensive part of the equipment of a metal working institution. A 3" x 14" special shaved Bull Neck wheel whole ply cut, 3 disks to the neck of a hide would cost as much as an ordinary auto wheel, rubber tire included.

The first wheel we used was the Block wheel covered with leather; the same kind of wheels are in use today in many shops. This wheel was made of ½-inch pine or poplar wood glued together. In making this wheel, the grain of the wood was crossed so that there would be no danger of the wheel bursting when run at a high rate of speed. After the pieces of wood had been glued together and dried the block was sawed round, turned off, and covered with the best center back leather on the face of the wheel. At that time, the leather on the face of the wheel was driven full of wooden shoe pegs, but later on the use of pegs was done away with as a better class of work was demanded and a wheel would scratch with pegs in the face of it. A man had to be a mechanic to work on and keep this class of wheel in condition. It had to run absolutely true at all times or there was danger of the leather blistering. The amount of labor and material used to keep this wheel in condition made it, in my opinion, the most expensive wheel used.

Wheels made from the neck of a hide, commonly called Bull Neck wheels, have been in use for a long time. The first ones were made of hemlock tanned leather and were used for roughing purposes mostly. This was a very light wheel as the leather had not been cured and it was of a reddish color. Later on the manufacture of leather cured the neck the same as the balance of the hide by putting a certain amount of oil to so many hides in a large wooden barrel and tumbling until the hides absorbed the oil, when the leather was rolled and cured. After this leather came into use the old hemlock red tanned dropped out of use entirely. Wheels made from this new material were used for many different classes of work. This wheel of special shaved, selected leather, was used by us for about 4 or 5 years as an oil and finishing wheel. At that time this was the best wheel for the purpose, but it was slow to work on; and it was almost impossible to get a good color on the work after it was plated and buffed as it had a tendency to burn the face of the metal, leaving a light grayish cast on the work after it was finished. The sea horse or walrus hide wheel was never used to any great extent in this locality. The hide was bought in square pieces and by the time a wheel was cut out it left too much waste, so the price made it prohibitive.

The old reliable canvas wheel was made by tearing the goods into squares, folding once each way then cutting the point off. This answered for the arbor hole. The canvas was then laid piece upon piece, placing the points so that no two would come together. The wheel made this way was then placed upon the spindle of the machine with a sheet steel flange on each side and tightened up with the nut. The machine was started

and the wheel was trimmed down with a turning tool made from an old file. This was the only buff used on ordinary work up until the circular sewed buff sections came into use. When this wheel was made for polishing it was taken off the machine and 5 or 6 nails driven through each side and again trimmed down with a buff stick and set up in the regular way. These wheels were not what could be called perfect, as the dust and grit would get in between the canvas and in a short time the goods would rot and pull out in chunks when it was necessary to clean off the wheel. Later, wheels were made and put together with glue or cement. The best wheels made today of this material are put together with pure rubber, cut to a liquid with naptha. This wheel, however, is not fool proof. If it is left on the steam pipe a few nights it will become necessary to drive a few nails into it in order to hold it together.

Felt for both polishing and buffing wheels is used today and has been in use for years on the finer grade of work. We used them at one time for all soft wheel work, but as the plain design work took the place of carved up work, a tougher and harder metal was required. They would not stand up and they became too expensive to use. The main fault with them was the amount of waste every time it was necessary to clean them off, which was quite often. A certain amount of felt went down the blower pipe or on the floor if a man burned a hole in the face of one, and it was necessary to turn off the entire face until he got below the burnt spot. A wheel after being burned once never works the same afterwards. It is a hard wheel to keep in balance and running true and is effected by atmospheric conditions. It is a good wheel on soft metal or steel but expensive on hard plate work.

Wheels made of compressed paper were never a great success. I have used them for roughing but never was able to hold the abrasive on them long enough to pay for setting them up. The wheel known to all oldtimers as the Chicago Compressed Wheel (at the present time is made and sold by an Eastern firm) is composed of a cast iron or steel hub and two stamped steel flanges. The material is set on edge crosswise. They are made up in leather felt, canvas and sea horse. This wheel, with proper care, will and has given satisfaction for years on many classes of work. The only real objection to it is the heavy metal hub, but this objection can be overcome somewhat by the use of felt washers instead of steel when in use upon a spindle.

Sheepskin in sections sewed like the circular sewed section and put together with either glue, cement or nailed around the arbor hole was used quite extensively on open round crow work such as elevator screen work or work of the type that does not call for first-class polishing. They are also made up by putting together single pieces of skin, using as an adhesive glue or cement and pressed hard. This wheel is used to a great extent as an oil or grease wheel in auto and plumbing supply shops, but on hard plate work it will not stand up, and lacks the staying qualities.

Wheels made from circular sewed buff sections by nailing the sections together around the arbor hole, turning them off, then sizing them up with a thin glue and when dry setting them up in the regular way, are used mostly for grill-elevator or round crown work to be antique brass or copper plated. The same section glued together and made into a wheel is used on all classes of heavy work to a greater or less extent. They give fairly good results on rough work but they ridge the work up on the finer class of work when used as a fine or oil wheel. They leave a frosty effect on the face of the metal that plating will not cover up, unless an extra operation on a felt or other close grain wheel is used, but felt at $3.85 per lb. comes high.

A modern wheel is made up of special sewed goods treated with a glutinous or rubbery solution about 1 quart to a 3 x 12 wheel, which gives it a body and a resiliency. It is made up in four grades: hard, medium, soft and super-felt. This is the most economical and liveliest working wheel in the long run that I know of. It will not rag out at the arbor holes; atmospheric conditions do not affect it; forgetting and leaving it on the steam pipe over night doesn't seem to hurt it. It does not burn the face of the metal, thereby giving the plater the highest lustre on the work.

---

## MELTING LOSSES AND BRASS CASTING PRICES.

Q.—1. Have you any data available in regard to the loss in remelting scrap brass, say for instance clean brass turnings, also in regard to the cost of remelting and casting into ingots.

The point is that we wish to determine whether it is cheaper for us to use virgin stock rather than to use our scrap.

2. Have you any data available in regard to the cost per pound of brass castings and the method of determining such a cost. We understand that the size and kind of the casting would affect the cost, but thought you might be able to answer this question in a general way, that would give us the information that we require.

A.—1-a. The loss in remelting turnings depends entirely upon the manner in which it is performed. In an open flame furnace the loss will be high due partly to oxidation and to volatilization of zinc. In the crucible it will be considerably lower and if the turnings are carefully pushed under the surface of the molten metal, the zinc loss should be kept down to 5%. We have seen turnings melted in an open flame or reverberatory furnace, but the operators were always careful to have a sufficient bath of metal in the furnace before putting in the turnings.

1-b. If the melting practice is good it is cheaper to use your own scrap. You know what is contained in it. You can keep it from being contaminated by iron or other impurities, and consequently you do not run the risk that you would in buying outside material.

2. The cost of making brass castings varies considerably as you know.

One foundry that we know of figures roughly as follows:

| Base Price | |
|---|---|
| Yellow Brass | 38c. per lb. |
| Composition | 46c. " " |
| Government Bronze | 58c. " " |

These prices are based on a production of about 17 pounds per hour per molder, which includes a small profit, say 10 per cent, but does not include the cost of coremaking. The molder is paid about 6 dollars a day and the helper about 4 dollars. Coremaking is figured at a cost of $1.52 per hour per coremaker. This also includes a 10 per cent profit. Please bear in mind that these are rough general figures, which would have to be altered with every change in the size of the castings and the price of metal.

---

## CORRECTIONS

On page 480 of our November issue, please note the following corrections:

In the first column, the paragraph beginning "On the paper 'Influence of heat treatment'," fourth line, "before treating" should be "after treating," and "degrees Fahr," should read "degrees Cent."

# WEEKS' ELECTRIC ROTATING FURNACE AS APPLIED TO THE BRASS FOUNDRY INDUSTRY

A Paper Presented before the Foundrymen's Convention at Philadelphia, October, 1919.
By F. J. Ryan, American Metallurgical Corporation, Philadelphia, Pa.

Philadelphia in 1908 saw the birth of the rocking electric furnace idea applied to the problem of brass, zinc and nonferrous alloys. To Charles A. Weeks, a Philadelphian, must go much of the credit for both the conception and the solution of the problem because of his untiring efforts in the face of unusual obstacles.

To see how clearly Mr. Weeks seemed to have sensed a solution of the electric brass furnace problem, we have only to inspect the equipment shown in Fig. 1, which might readily be mistaken for a photograph of a modern installation, whereas it was taken nearly 10 years ago at the works of the General Electric Company, where Mr. Weeks carried out many tests in co-operation with the designing engineers of the same organization. Some

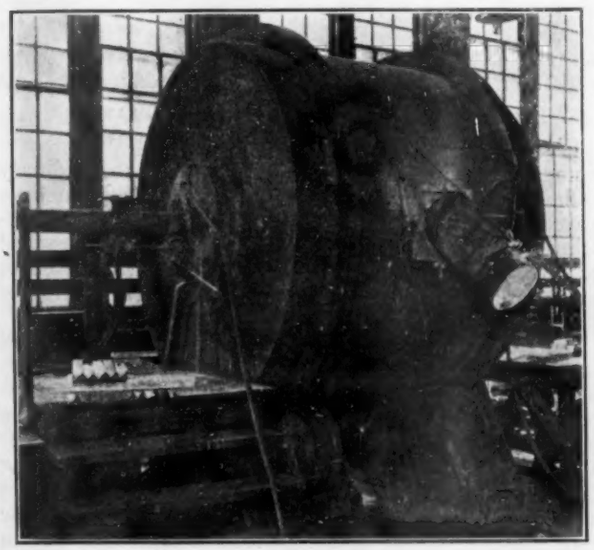


FIG. 1.—WEEKS' ELECTRIC ROTATING BRASS FURNACE OF AN EARLY TYPE.

of the zinc ingots produced can be seen on the platform at the side of the furnace. Comparison of the original furnace with the present design as shown in Fig. 2 shows only a general refinement and solution of operating, and mechanical problems without radical changes in the basic thought.

## TWO VITAL PROBLEMS

Brass melting presents two vital problems: segregation and volatilization of zinc.

Segregation results from the different fusion or melting temperatures of the different alloys. In other words if you have three alloys, each with a different melting or mixing point, you will find that at the time when the material with the lowest melting point has become liquid, the other two are still sluggish and will not combine unless some method of stirring is resorted to. On this account in a still bath hand stirring or rabbling must be resorted to, or else sufficient heat to bring all the constituents to the combining temperature must be applied. In such cases, however, the zinc has reached a point where it becomes volatile and a large part passes off as gas.

A solution for this condition in an electric furnace is automatic stirring whereby the surface exposed to the arc is continually changed. The revolving furnace is designed to accomplish this result.

It has always been recognized that a great advantage would be gained if the heat could be applied at both the top and bottom of the charge. Mr. Weeks seems to have secured this result in his first experimental furnace. He secured both the result mentioned and obtained a mechanical means of stirring the bath.

## HOW BOTTOM HEAT IS SECURED

The application of bottom heat is obtained through the absorption value of the refractory lining; that is, the lining section exposed directly to the electric arc absorbs a large amount of heat and when this in turn becomes the hearth as the furnace rotates, it gives out the absorbed heat to the charge from the bottom. With the steady alternation of the hearth against the charge there is a continual application of heat. While this alternation is going on, the charge is stirred by the movement of the furnace body. Further, by the alternation of the exposed refractories, the wear from burning or fusing from the high heat of the arc is reduced to a minimum.

Briefly, without going into technical results which cover a wide field and would take a large amount of space, it can be seen from practical observation that through the simple discovery of Mr. Weeks, important problems in the field of brass foundry melting have been solved, at least until such a time as our ever-changing mechanical and chemical applications bring to us some new discovery.

In the following paragraphs will be reviewed briefly the principal details in connection with the construction and method of operating this equipment.

## FURNACE LINING

All available refractory materials applicable to this type of furnace equipment have been experimented with and while fair success resulted from the use of 9-inch clay blocks with a 6-inch layer of electrically fused magnesite mixed with china clay and boric acid, it was finally decided to recommend for the present a special silica lining.

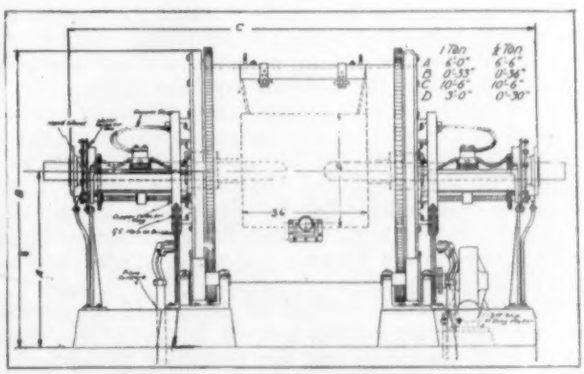


FIG. 2.—IMPROVED DESIGN OF ROTATING ELECTRIC BRASS FURNACE.

The blocks composing this lining are reduced to a minimum with a proper allowance for shrinkage. Actually, the circular section is composed of six interlocking blocks capped at each end with a solid capping piece. Between the shell and the lining is placed 2 inches of insulating material in a loose form which allows for the

expansion of the main lining and reduces radiation to a minimum.

By constructing the lining in this manner, quick replacement is made possible and a large percentage of the checking wear eliminated as would be the case in a lining composed of small brick.

From the reports received from a large manufacturing concern in this country, the writer has every hope that within a short space of time it will also be possible to supply a lining of magnesite blocks made under a special process in the same form as the present lining. Experiments so far carried out show promising results. The furnace of course, can be lined with any other materials chosen by the operator.

### ELECTRODES

Graphite electrodes are recommended on account of their current carrying capacity and lightness which allows for ease of handling and cuts down loss in breakage. The furnace, however, can be adapted to the use of carbon electrodes where desired.

One of the chief radical changes from the original furnace design is the method of taking power into the furnace. In previous designs it has been necessary to have objectionable overhead swinging cables to allow for the movement of the furnace drum. Such construction causes loss in voltage on account of excessive length of cable and necessitates a very much greater amount of room for installation than is necessary under the design submitted, whereby the current is taken in through a shoe at the bottom of the furnace out of the way of the operator. This also allows for the placing of the transformers close to the furnace.

In this type of construction it also is not necessary to disconnect the cables when the furnace body is removed from the rollers for relining.

### MECHANICAL OPERATION

Briefly the furnace, as will be noted from Fig. 2, is a circular steel drum located on four rollers with double gearing at each end of the drum connected with a driving shaft at the rear. The shaft is connected to a gear reduction to allow for two complete revolutions per minute. By a special method of automatic switches the drum can be rotated to any percentage of its circumference at the will of the operator, a special control making it possible to set operation at any given point.

Water connections are made through permanent entrance from below to a sliding water jacket which allows for a larger flow or cooling capacity at a low pressure, and also eliminates flexible and overhead piping.

The electrodes, it will be noted, are driven by a wheel stationed at the axis of the furnace, making no movement on the part of the operator necessary except a gripping of the wheel, and allowing the motion of the furnace body to take care of the necessary movement.

Both the electrode clamp and the electrode socket at the entrance of the furnace are water cooled at both sides of the furnace.

On account of the method of lining and the general simple construction of the furnace it is possible to put in a door of practically any size necessary to meet operating conditions. The pouring spout is located at a point whereby it is possible to entirely empty the full charge of the furnace with a spout movement of only 2¾ inches. If necessary as in ingot pouring for the rolling of copper or brass sheets, a connection can be made to the rear driving shaft whereby the ingot carriage will be synchronized with the movement of the furnace spout.

Fig. 3 shows a typical layout of three 1-ton furnaces. It is included to show the possibilities of installation of this type of furnace. When it is realized that each one of these furnaces would have a capacity of 20 heats per day of 24 hours, giving a total daily capacity of 60 tons within approximately a floor space of 60 x 60 feet, it will then be appreciated what this development has made possible in the way of increasing plant capacity without the necessity of additional floor space.

### THEORETICAL ADVANTAGES

It may be well to mention briefly the theoretical ad-

FIG. 3.—A TYPICAL THREE FURNACE PLANT.

vantage that the electric furnace has over the ordinary oil-fired furnace. Operations and experiments have proved that such is the case, but the theory is also interesting in that it shows that we have not yet reached the ultimate possibilites which will come when the art has been finally developed to its highest point of efficiency.

The electric furnace may be made practically a sealed instrument preventing the access of air which means that so long as the vapor pressure of zinc in the charge does not exceed atmospheric pressure, the maximum possible loss of zinc must be the furnace fuel of zinc vapor.

At the usual pouring temperature of a 20 per cent zinc brass each cubic foot of gas saturated with zinc vapor contains approximately 0.025 pound of zinc. In a perfectly closed electric furnace of 150 cubic feet capacity (one of Weeks' experimental furnaces) heated uniformly, the maximum loss due to volatilization would be 3.75 pounds zinc, and this would be practically independent of the total amount of brass in the furnace, and also independent of the length of time the metal was kept at that temperature. With a 2-ton charge the loss would be 0.094 per cent. Similarly the loss of zinc from a 40 per cent zinc brass at its usual pouring temperature would be somewhere near 0.12 per cent. The loss of copper would be negligible so far as volatilization is concerned.

On the other hand, we have seen that the fuel-oil fired furnace requires that some 10,000 cubic feet of hot combustion products leave the furnace for each 100 pounds of red brass melted. If these gases left the furnace saturated with zinc at the final pouring temperature, they would carry with them many times the amount of zinc originally charged. Fortunately the gases do not by any means all leave the furnace saturated with zinc at the final pouring temperature, not even the gases towards the end of the heat, since with a uniform gas velocity the gas does not remain in the furnace for more than a fraction of a second. But if brass is left in an oil-fired furnace, under blast, after it is ready to come out, it does certainly follow that the zinc percentage in the melt will drop off at an alarming rate.

The same arguments might be used in comparing op-

portunities for oxidation. Considering both practices in practical operation, it is quite certain that the electric furnace has the decided advantage.

It can therefore be seen that the possibilities of a furnace of the design submitted operating on brass has tremendous possibilites in connection with the saving of zinc that is now being lost through volatilization.

Results already accomplished on material such as electrolytic copper show a loss not exceeding 0.75 per cent and in high zinc mixtures the losses run anywhere from 1½ to 3½ per cent varying with the zinc contents.

### SOME COPPER LOSS

Theoretically there is no loss in copper, but in actual practice small amounts become impregnated with the lining or pass off in the slag.

In closing the writer would like to explain the apparent lack of submission of technical data supporting the claims made herein. This is intentional for the reason that the usual brass foundry problem is individual and not collective. For instance, the average brass foundry in the Detroit district catering to the automobile trade may be using mixtures which would be quite different from those that would be used in the Philadelphia foundry catering to the shipping industry, and as the user will want to know the operating conditions surrounding his specific problem, it was thought best to make the paper general.

It might also be mentioned that guarantees of operation are many times confusing. By this statement it is not meant to intimate that engineers or manufacturers misrepresent their product, but to point out that they are highly specialized in the handling of their own individual product, whereas the installation must be adapted to a human organization and into problems of general metallurgy enters more human intelligence and co-operative ability than probably in any other. Although a special trained corps of experts may be able to produce specific results, this is no guarantee that the ultimate customer will obtain these same results unless the organization is always available for co-operative work.

In other words, the engineer or engineering contractor should take a new place in general industrial operations. The mere design and installation of equipment should not sever his relations. The practical man recognizes the necessity of the expert to his organization and the expert should recognize and promote closer relations with the practical man.

## WASTE IN MELTING ALLOYED METALS

By E. H. Schulz and H. Winkler

(Translated for The Metal Industry from Metall und Erz)

The waste of metal in remelting, especially in the case of turnings and other forms of scrap, is very considerable, and is of particular importance when metals are scarce, so that accurate information as to the causes of such waste becomes highly desirable, and it was with this object that the experiments described below were undertaken.

### MELTING BRASS IN THE REVERBERATORY FURNACE

The amount of loss in melting brass is determined by three factors: the type of furnace used, the chemical composition of the brass, and the quantity of scrap added. Now the reverberatory furnace is far more wasteful than the crucible furnace, especially as regards the loss of zinc, and, in point of composition, a higher zinc content in the brass implies greater waste in melting; whilst the loss also increases with the amount of scrap added, especially when this scrap is much oxidized or in small pieces (fine turnings or filings). Again, when a new furnace is started, there will always be considerable loss during the first four or five charges, owing to the brass penetrating into the brickwork of the furnace.

Two experimental meltings were carried out with brass, containing about 72 per cent of copper. No. 1 comprised 33 per cent of new metal (Cu and Zn) and 67 per cent of old brass strips and turnings. No. 2 was made up of 80 per cent of scrap and only 20 per cent of new copper and zinc. In both cases the conditions were unfavorable in respect of both the quantity and nature of the added scrap.

The following table shows the composition of the charges and products:—

| | | | Cu. Kg. | Zn. Kg. |
|---|---|---|---|---|
| Charge:— | | I. 69% Scrap. | | |
| 565 | kg. | copper | 565 | ... |
| 265 | " | pure zinc | ... | 265 |
| 1,170 | " | scrap sheet brass (72% Cu.) | 843 | 327 |
| 500 | " | turnings (72% Cu.) | 360 | 140 |
| Total... 2,500 | kg. | | 1,768 | 732 |
| Products:— | | | | |
| 2,349 | kg. | brass ingots | 1,691 | 658 |
| 27 | " | brass from the scoriæ | 19.5 | 7.5 |
| 23 | " | copper | 23 | ... |
| Total... 2,399 | kg. | | 1,733.5 | 665.5 |
| Loss:—Kg. | | | 101 | 34.5 | 66.5 |
| | | in % of charge of Cu and Zn | 4.05 | 1.95 | 9.1 |
| | | in % of total charge | ... | 1.38 | 2.66 |
| Charge:— | | II. 80% Scrap. | | |
| 325 | kg. | copper | 325 | ... |
| 175 | " | pure zinc | ... | 175 |
| 1,300 | " | scrap sheet brass (72% Cu.) | 936 | 364 |
| 700 | " | turnings (72% Cu.) | 504 | 196 |
| Total... 2,500 | kg. | | 1,765 | 735 |
| Products:— | | | | |
| 2,180 | kg. | brass ingot | 1,570 | 610 |
| 28 | " | brass dross | 20.2 | 7.8 |
| 3 | " | casting waste | 2.2 | 0.8 |
| 14 | " | copper | 14 | ... |
| Total... 2,225 | kg. | | 1,606.4 | 618.6 |
| Loss:—Kg. | | | 275 | 158.6 | 116.4 |
| | | in % of charge of Cu and Zn | 11.0 | 9.0 | 15.9 |
| | | in % of total charge | ... | 6.3 | 4.65 |

In connection with these figures it should be mentioned that the melt No. 1 furnished in reality 109 kg. of high-grade dross which could not be worked up in the manner customary in practice, the amount being too small. The potential yield of metal from this dross was, therefore, calculated in accordance with the results of experience, 25 per cent of such metal being recoverable as brass and the remaining 75 per cent as copper.

The losses in melting were 4.05 per cent in No. 1 melt and 11.0 per cent in No. 2. The relatively high loss shown by the latter is partly due to the larger proportion of scrap in the charge. On the other hand, a loss of 4 per cent is very low, and is, apparently, attributable to specially favorable conditions and the observance of precautions that would hardly be practicable under ordinary working conditions.

The incidence of the losses can be seen from the last two columns of the table. It is worthy of note that the

relative loss of copper in No. 2 is higher than the relative loss of zinc; but further work is neccessary to ascertain whether this also is due to the larger percentage of scrap used. In general, the bulk of the loss may be expected to be in zinc, the losses of copper being merely slight.

Taking the mean of the two experiments, it may be assumed that, under the conditions employed, melting in a hearth furnace with an addition of 67-60 per cent of brass scrap of somewhat poor quality will result in a loss of 7.5 per cent of the charge.

### II. MAKING CU-AL-ZINC ALLOYS IN IRON POTS

The alloys were made from metallic copper, aluminum and zinc, each being melted separately—the copper and aluminum in small furnaces and the zinc in the large pots in which the alloy was prepared, the other two metals being poured into the molten zinc, and the alloy cast in iron moulds. The residual zinc scum was used in the succeeding melt.

The charge of metal consisted of zinc (containing 1.3 per cent of lead), 12,500 kg.; copper, 440 kg.; aluminium, 575 kg.: total, 13,515 kg. This yielded:—

13,217 kg. of zinc alloy (3 per cent Cu and 3.5 per cent Al)
116 " " zinc scum
40 " " copper scale
32 " " aluminium scale

Experience shows that 90 per cent of the zinc scum is eventually recovered in the form of alloy, and the analysis of samples of the copper and aluminium scale showed that 8 per cent and 14 per cent respectively could be recovered as metal. Therefore, taking into account the further treatment of the intermediate products, the yield would be:—

| | |
|---|---|
| Alloy ..... | 13,217 kg. |
| Do. from the zinc scum ..... | 104 " |
| Copper from the scale ..... | 3 " |
| Aluminium from the scale ..... | 5 " |
| Total ..... | 13,329 kg. |

Referred to the total weight of the charge, this indicates a loss of 186 kg. or 1.38 per cent, and in comparison with the finished alloy a loss of 1.41 per cent.

To ascertain the proportionate distribution of this loss between the three metals, samples A, B, and C, representing the beginning, middle and end of the pouring, were taken, and found to contain:—

| | Zn. (by diffce.) | Cu. | Al. | Pb. | Fe. | |
|---|---|---|---|---|---|---|
| A ..... | 92.38 | 2.86 | 3.39 | 1.0 | 0.37 | per cent |
| B ..... | 92.41 | 2.90 | 3.59 | 0.99 | 0.11 | " " |
| C ..... | 91.66 | 2.92 | 4.28 | 0.97 | 0.17 | " " |
| Mean ..... | 92.15 | 2.89 | 3.75 | 0.99 | 0.22 | " " |

The finished alloy and that from the zinc scum therefore contained: copper 385 kg., aluminium 500 kg., zinc (with the Fe and Pb impurities) 12,436 kg. Including the copper and aluminium recoverable from the scale, the total yield would be: copper 388 kg., aluminium 505 kg., and zinc 12,346 kg., *i. e.* 13,329 kg.

The following table shows the incidence of the total 1.4 per cent of loss as regards the individual metals:—

| | Zn. Kg. | Cu. Kg. | Al. Kg. |
|---|---|---|---|
| In charge of metal..... | 12,500 | 440 | 575 |
| In alloy and intermediate products..... | 12,436 | 388 | 565 |
| Melting losses | | | |
| (a) Weight ..... | 64 | 52 | 70 |
| (b) Per cent of original metal... | 0.51 | 11.80 | 12.20 |
| (c) Per cent of finished alloy (13,217 kg.) ..... | 0.48 | 0.39 | 0.53 |

These data indicate that the highest loss falls on the aluminium in this method of making the alloy, the absolute loss of zinc being even smaller than that of copper.

### III. LOSS IN MAKING ZN-AL (2-2.5 PER CENT) ALLOY

The alloy, which was intended for stampings, was prepared in a crucible furnace, one charge being melted in a graphite crucible and the other in an iron pot. The material consisted almost entirely of scrap—much oxidized turnings and filings—the first charge being compounded of equal weights of this scrap and the remainder of lump scrap with a few clean turnings and a small addition of an alloy of 70 per cent Zn and 30 per cent Al. The second charge was composed wholly of scrap.

The following table summarizes the results, the average loss being 45 per cent of the charge:—

| Crucible. | I. Graphite. | II. Iron. |
|---|---|---|
| Charge:— | 160 kg. old turnings.<br>78 " new turnings.<br>78 " lump scrap.<br>4 " Zn-Al alloy. | 422 kg. old turnings. |
| Containing scrap:— | 50% poor scrap.<br>24.4% good scrap. | 100% poor scrap. |
| Yield: Ingots..... | 221 kg. | 171 kg. |
| Dross (practically free from metal)..... | 90 | 240 |
| Yield in % of charge..... | 69% | 40.5% |
| Loss in melting..... | 31% | 59.5% |

This relatively high loss is due to the presence of a large proportion of very fine particles (almost like dust), which were in an advanced stage of oxidation. It was also necessary to run the crucibles at a very high temperature to obtain satisfactory separation of the molten zinc from the large amount of dross and dirt present, a comparatively high percentage of the zinc being consequently lost by volatilisation. The dross was too low in metal to make any attempt at recovering the latter unprofitable.

### LOSS IN RE-MELTING ALUMINIUM

The following points are the result of experience in practice, no special experiments having been made by the authors. With reverberatory furnaces the loss is naturally greater than in melting in crucibles, but the former system is preferred in many large works because of the larger output obtainable. The material to be remelted is usually turnings, which for the most part represent alloys high in aluminium, though, during the war, large quantities of domestic utensils, etc., of pure aluminium had to be melted down. In all cases the losses are highest with turnings and depend on the fineness and purity of the material. Moreover, there is great difficulty in separating the specifically light molten aluminium from the floating slag. The more dusty material and dirt in the turnings and the more oxide adhering to them at the start, the greater the production of dross and, therefore, the loss of metal. The conditions are more favorable when domestic utensils or sheet aluminium are being melted down, the loss then rarely exceeding 5 per cent in the reverberatory furnace, provided, of course, that a proper melting heat is maintained and the operation properly managed in other respects. In melting down the aluminium parts of a naval airship, the loss was somewhat higher (7-8 per cent), although the material was in the form of fairly stout channel and angle bars. This higher loss was due to the extensive corrosion of some of the parts by the sea air, and the consequent larger percentage of oxide, the corrosion in certain cases being so great that the parts could be broken with the hands. The following table gives the results of four charges, all composed of turnings:—

| | 1. Very Good. | 2. Good. | 3. Bad. | 4. Bad. |
|---|---|---|---|---|
| Quality of turnings..... | | | | |
| Weight of charge.....Kg. | 1,978 | 3,202 | 2,758 | 14,495 |
| Moisture and oil.....% | 9.4 | 7.34 | 14.1 | 3.0 |
| Yield of ingots.....Kg. | 1,643 | 2,570 | 2,064 | 11,043 |
| Loss .....Kg. | 335 | 632 | 694 | 3,452 |
| Loss in % of charge.....% | 16.9 | 19.7 | 25 | 23 |
| Dryweight of charge .....Kg. | 1,782 | 2,967 | 2,361 | 14,060 |
| Loss referred to dry weight.....Kg. | 139 | 397 | 297 | 3,017 |
| Loss in % of dry weight.....% | 7.8 | 13.4 | 12.6 | 21.4 |

On the average, therefore, a loss of 21 per cent may be reckoned with in re-melting damp aluminium turnings, or 13.5 per cent of the dry weight of the charge.

# ELEMENTS OF ELECTRO-CHEMISTRY

SOME INSTRUCTION FOR THE PLATER WHO WISHES TO UNDERSTAND THE THEORY OF WHAT HE DAILY PRACTICES. WRITTEN FOR THE METAL INDUSTRY BY JOSEPH HAAS, JR.—EIGHTH PAPER.†

## CALCULATION OF DEGREE OF DISSOCIATION FROM CONDUCTIVITY MEASUREMENTS

It has just been shown that dissociation and conductance are proportional and that a limit in conductance is reached when dissociation is complete. Therefore, conductance should be a measure of the degree of dissociation. If we take a given weight of an electrolyte, as a gram equivalent or molar weight, and determine its conductance in increasing volumes until conductance is constant, the dissociation is complete and the conductance is the maximum conductance and is denoted by $K\infty$. Now if we wish to determine the degree of dissociation at any other volume, we measure the conductance at that volume which is denoted by Kn. The ratio of Kn to $K\infty$ denotes the degree of dissociation,—$X$. In the case of equivalent solutions the equation would be

$$X = \frac{E.K.n}{E.K.\infty}$$

and in molar solutions,

$$X = \frac{M.K.n}{M.K.\infty}$$

Example: The $E.K.\infty$ of H Cl is 384 mhos. A litre of H Cl solution containing 1.825 grams per litre has a resistance of 0.5555 ohms.

(1) How many gram equivalents does it contain?

1.825 grams per litre $= \frac{1.825}{36.5} = 1/20 = 0.05$ gram equivalent.

(2) What is the conductance of the 1/20 equivalent solution?

$$K = \frac{1}{R} = \frac{1}{0.05555} = 18.0018 \text{ mhos.}$$

(3) What volume would a whole gram equivalent of the H Cl solution occupy?

1/20 equivalent occupies 1,000 c.c.

∴ 1 equivalent would occupy 20,000 c.c.

(4) What would be the E.K. of a whole gram equivalent?

$E.K._{20000} = 18.0018 \times 20 = 360$ mhos.

(5) What is the degree of dissociation?

$$= \frac{E.K.20{,}000}{E.K.\infty} = \frac{360}{384} = .937 = 93.7\%.$$

## TRANSPORT NUMBERS

It has been shown, that when an electric current is passed through a solution of an electrolyte, that changes in concentration at the anode and cathode, in general, are not the same. Since it has also been shown, that equivalent amounts of positive and negative ions are discharged at the electrodes, and the velocity of migration of the ions is different, it follows that the quantity of electricity which is carried by the positive ions is different from that carried by the negative ions. Work by Hittorf has shown that the quantity of electricity carried by the anion and the cathion respectively is in proportion to the velocity of the anion and cathion. Representing the amount carried by the anion by $X$ that carried by the cathion would be $1 - X$ and we would have

$$\frac{1-X}{X} = \frac{Vc}{Va} = \frac{\text{Loss at anode}}{\text{Loss at cathode}}$$

The total amount of electricity passed through the solution is equal to the sum of the velocity of the anion (Va) and the cation Vc. Therefore, the fraction of the

total current carried by the anion $= \frac{Va}{Va + Vc}$;

that carried by the cation $= \frac{Vc}{Va + Vc}$ or

$$X = \frac{Va}{Va + Vc}\ ;\ 1 - X = \frac{Vc}{Va + Vc}.$$

These fractions are known as transport numbers. In practice, the transport numbers are obtained by determining the total amount of electricity passed by means of a coulometer and the amount of one of the ions which has migrated away from the space around one of the electrodes. In this method of determining transport numbers, it is assumed that the change in concentration takes place only in the neighborhood of the electrodes and that the intermediate portions of the solution remain unaltered. It is evident that the current must not be allowed to pass too long. Another reason why time must be limited is that alternation in composition would otherwise be caused by diffusion.

By studying the concentration at electrodes, Hittorf determined the composition of the ions resulting from dissociation.

$$Ag\ CN + KCN = K\ Ag\ (CN)_2$$

When a current of electricity is passed through K Ag $(CN)_2$, Ag is deposited upon the cathode. By determining the concentration of $Ag^+$ and $K^+$ about the cathode before and after electrolysis, it will be found that including Ag deposit, an increase in $K^+$ concentration above that of the silver had taken place, corresponding to the quantity of electricity passed through the solution. Hittorf interrupted the results that potassium forms the positive ions and that silver together with cyanogen form the negative ion. In solution he said that K Ag $(CN)_2$ ionizes as follows:

$$K\ Ag\ (CN)_2 = K^+ + Ag\ (CN)_2$$

Investigations as to whether a metal exists in the negative or positive ion can be carried on by a study of concentration changes that take place about the anode during electrolysis. Since at the anode no deposition of metal takes place, then, if the anion is not decomposed at the electrode, the solution about the anode will become concentrated in respect to this ion. If the metal in question is a part of the anion, the solution will become concentrated in respect to this metal. On the other hand, if it is a part of the cation, it will migrate away from the anode section.

## PRINCIPLE OF KOHLRAUSCH IONIC CONDUCTIVITIES AT COMPLETE DISSOCIATION

This principle expresses that the conductance of an electrolyte depends on or is equal to the sum of conductances of its ions. The conductance of a cation is denoted by lc and that of an anion by la.

Example.—The equivalent conductance of a 0.1 molar solution is 351 mhos at 18 deg. C. Experiment shows

†This series began in April, 1918.

that $H^+$ carries 84 per cent of the current and $Cl^-$ only 16 per cent. The conductance of this solution may be considered, the sum of the share of the hydrogen ions in carrying the current ($0.84 \times 351 = 295$) and the share of the chlorine ions ($0.16 \times 351 = 56$). Therefore it may be said that for complete dissociation:

$$E.K. = la + lc$$
$$M.K. = la + lc$$

How well these equations hold may be judged from the following problems. The molecular conductance of K Cl is 111.9 and that of $Na\,NO_3^-$ 87.4. The transport numbers of the anions, Cl and $NO_3^-$ are 0.508 and 0.615 respectively. From this data, ionic conductances are calculated:

$$K^+ = 0.429 \times 111.9 = 55.1$$
$$Cl^- = 0.508 \times 111.9 = 55.8$$
$$Na^+ = 0.358 \times 87.4 = 33.6$$
$$NO_3^- = 0.615 \times 87.4 = 53.8$$

Now if these numbers really depend on the properties of the ions, it should be possible to build up the conductances of other salts. Namely:

$$K\,NO_3 = 55.1 + 53.8 = 108.9$$
$$Na\,Cl = 33.6 + 55.8 = 89.4$$

The results are considered to be fairly accurate and compare well with conductivity measurements, which give for $K\,NO_3$ 104.4 and for Na Cl 92.5.

### Summary of Theoretical Relations on Conductance of Electrolytes

(1) A gram equivalent of ions carries a charge of 96,540 coulombs. If there are X equivalents (say of cations) in 1 c.c., the quantity of positive electricity in 1 c.c. = 96,540 X.

(2) If the cations are subjected to unit potential graduced by one equivalent of ions moving with this velocity will be = 96,540 Vc. This is called the ionic conductance for complete dissociation and is denoted by lc.

(3) The conductance of one equivalent of an electrolyte when completely dissociated is the sum of the dient, they move with a velocity V¹c. The current proconductance of its ions.

$$E.K.\infty = lc + la = 96540\ (Vc + Va)$$

(4) If dissociation is incomplete and amounts to X,

(5) The conductance of a solution depends upon three factors—the concentration of the electrolyte, degree of ionization of the electrolyte, and the mobilities of the ions in the solution.

### Technical Importance of Electrical Conductance

A knowledge of the conductance of various solutions under various conditions of temperature and composition, concentration is essential to the proper management of a plating room, for it should be the aim of every plater to work with that solution that has the best conducting power. Furthermore, it is preferable to carry out plating operations at a high temperature if the cost of heating does not exceed the saving in electrical energy due to the increase in conductance. In plating operations the concentrations of electrolytes are chosen at will inside of wide limits without injury to any plating operations. However, that concentration should be chosen which gives the greatest "specific conductance." This side of the plating operations has received very little attention by practical platers and will become of more and more importance as the plater increases his knowledge of chemistry.

## CLEANING, PICKLING AND ZINC PLATING ADAPTERS.*

By J. C. Singer, Cleveland Branch. A. E. S.

I zinc plated about 6,000,000 pieces, aggregating about 3,000,000 pounds of steel war work known as Adapters' Mark -1 and Mark -2. The Mark -1 was made of bar steel reamed with an inside clearance of an inch, about nine inches long, the inside was plated. This was accomplished with inside anodes covered with a cotton jacket. The thickness of the plate was .0001½ of an inch. This thickness of plate will stand the 100-hour salt spray government test, and we were able to put this on in six minutes with a solution of:

4 oz. cyanide;
4 oz. caustic soda;
4 oz. sodium cyanide;
1 gallon of water.

With this kind of a solution I find that you cannot make a mistake even if you go as high as six ounces of each per gallon. The only difference you will find a little more gas. Faster and nicer plating as the articles come from the tappers with a mixture of oil and white lead all over the inside and outside, so the cleaning became quite a problem. We started in with caustic soda but soon changed. We found out there are cleaners and cleaners, but nevertheless our cleaners did the work. We had about 5,000,000 pieces, known as Mark -1.

Mark -2 was of regular 1⅜-inch steel tubing, with a scale on some o fthem as much as .0005 of an inch, so of ocurse our trouble came in with the pickling. We tried every pickle known to platers. In one we had a piece of tubing cut into four gauges with micrometer found to have a scale on .0005 of an inch. We put one ineo straight muriatic acid, one into 80 to 20 per cent sulphuric acid pickle cold, and one into a hot pickle of nitre cake. It required 58 minutes in the muriatic, two hours in the sulphuric pickle and 30 minutes in the nitre cake. We found that we could boil this pickle and have no offensive fumes on scum on the work. Of these we plated 10,000,000 pieces. Two pieces are one complete adapter.

In gauging the thickness of a zinc plate without micrometer it will be found that an 1,180 specific gravity of copper sulphate solution will remove .0001 of inch in 45 seconds, thee remove, wipe off scum and dry; then repeat operation; in this manner you can gauge even more accurately than with micrometer.

---

## PICKLING AND BRIGHT DIPPING*

Q. What is a good bright dip, for brass and copper?

A good way to do bright dipping is to use a burning off dip composed of one part water and one part nitric acid. First run your work through a cleaning solution and then in the burning off dip and from there directly into the bright dip. In using the burning off dip, you remove any oxide on the parts, and that gives you a clean surface to work on. When you want to speed up the bright dip, add nitric, and if it works too fast, add sulphuric.

Q. What advantage has salt or lamp black in bright dip?

A. It has been found that by adding lamp black or salt to a bright dip you get a more lustrous finish.

We hope other branches of the society take these questions up, and if they have a better way of doing these things, the yshould let us know through the Review.

*The Monthly Review. A. E. S.

# EDITORIAL

Vol. 17 New York, December, 1919 No. 12

# THE METAL INDUSTRY

With Which Are Incorporated
THE ALUMINUM WORLD, COPPER AND BRASS, THE BRASS FOUNDER AND FINISHER, THE ELECTRO-PLATERS' REVIEW
Published Monthly
Member of Audit Bureau of Circulations

Copyright 1919 by
THE METAL INDUSTRY PUBLISHING COMPANY
(Incorporated)

Entered February 10, 1903, at New York, N. Y., as second class matter under Act of Congress March 3, 1879

SUBSCRIPTION PRICE, United States and Canada $1.00 Per Year. Other Countries $2.00 Per Year :: SINGLE COPIES, 10 CENTS
Please Remit by Check or Money Order; Cash Should be Registered

ADVERTISING RATES ON APPLICATION
FORMS CLOSE THE FIRST OF THE MONTH

Palmer H. Langdon ..... Editor and Publisher
Adolph Bregman - - - - - - - - - - - - Managing Editor
George W. Cooper ..... Advertising Manager
Thomas A. Trumbour ..... Circulation Manager

ADDRESS ALL CORRESPONDENCE TO
THE METAL INDUSTRY, 99 JOHN STREET, NEW YORK
Telephone Number Beekman 404 Cable Address, Metalustry

## CONTENTS

| | Page |
|---|---|
| Further Progress in Ingot Production | 507 |
| Water Japan | 509 |
| Annealing Equipment | 510 |
| U. S. Mining Medal Given to Schneider, Schwab of France | 510 |
| Magnesium as a Seavenger of Metals | 511 |
| British Brassworker's Visit to Germany | 512 |
| Pickling and Bright Dipping | 513 |
| Production, Cost and Profit Control | 514 |
| Plan Reports and Records | 516 |
| Polishing Wheels | 517 |
| Melting Losses and Brass Casting Prices | 518 |
| Corrections | 518 |
| Weeks' Electric Rotating Furnace as Applied to the Brass Foundry Industry | 519 |
| Waste in Melting Alloyed Metals | 521 |
| Elements of Electrochemistry | 523 |
| Cleaning, Pickling and Zinc Plating Adapters | 524 |
| Pickling and Bright Dipping | 524 |
| Editorials: | |
| A Co-operative Research Association | 525 |
| A One-Man Department | 525 |
| Industrial Peace | 526 |
| Shop Problems | 527 |
| Patents | 530 |
| Equipment: | |
| Ajax Metal Company's Exhibit | 532 |
| Branford Vibrator Core Bench | 532 |
| The Rhine Automatic Shock Absorber | 532 |
| The Sandhog | 533 |
| Maxon Double Chamber Furnace | 533 |
| Ambrine Treatment for Burns | 533 |
| Wiederwax Preheater | 534 |
| Duplex Buffing Machine | 535 |
| The Klaxocator | 535 |
| Associations and Societies | 536 |
| Personals | 537 |
| Trade News | 539 |
| Metal Market Review | 549 |
| Metal Prices | 550 |
| Supply Prices | 552 |

## A CO-OPERATIVE RESEARCH ASSOCIATION

An interesting sign of the change of spirit in industry is a new organization, the American Malleable Castings Association, Euclid Building, Cleveland, Ohio, which calls itself an association of malleable iron founders for the purpose of establishing a uniformly high standard of quality, by co-operative scientific research and education.

When an industry by the concerted efforts of its members evidences a determination to establish a high standard of quality for its product, it is natural that considerable interest should be aroused. This was the responsibility assumed at the time of its organization, and its recent announcement of the course pursued and the results obtained is an interesting commentary of its most commendable activities.

Aside from the various research laboratories of its members, the association has maintained at Albany a research department for investigation and experiment and for the testing and analysis of the daily output of each member of the association. Impartial tests were made and the results, together with the direction for improvement where the need is indicated, forwarded to the respective members.

It is most encouraging to find such a shining example of men in industry, who are nominally competitors and ordinarily fighting each other tooth and nail, who still believe that co-operation is the real road to success; that their salvation is to be gained, not by cutting each other's throat, but by getting together and improving the quality of their product.

## A ONE MAN DEPARTMENT

Among our numerous inquiries we have a request for a plating solution which reads as follows:

"Some four or five years ago our plater made up a nickel solution from a formula printed in THE METAL INDUSTRY, which has given great satisfaction on brass work. We wish to make up another solution at once, just like it, but the man referred to has left the city, and we are unable to find the formula."

This illustrates the fault of leaving matters of importance or information in the hands of only one man. It is perfectly obvious that if that one man were taken ill or were unable or unwilling to return to work the whole department would be broken up. How many plants in the metal industries have departments which are in just such danger? It occurs to us, that although few would admit it, that many are actually in just such a position. It is folly to leave a plant or an organization of any kind to the mercy of chance, or the good intentions of any one man. How many instances are there of platers, melters and refiners upon whom the operation of the plant depends, and without whom it would be forced to shut down?

It is a truism, of course, but nevertheless worth repeating that the system of an organization should be such, and substitutes or understudies trained so that half of the men could leave and the plant still go on.

## INDUSTRIAL PEACE

In the light of the present unrest, it is most interesting to note the solutions for these conditions advocated by various men of prominence.

Daniel Guggenheim, of Guggenheim Bros., who are in control of a large part of the copper interests in this country, advocates the following changes:

1st:—Congressional legislation chartering both employers' and employees organizations involved in interstate business.

2nd:—Passage of a law preventing strikes or lockouts without full investigation and report.

3rd:—Laws making decent working conditions, and hours of labor which have been voluntarily put into effect by some employers to be made compulsory.

4th:—Use of moral suasion to force arbitration. Employers and employees to be compelled to respect their agreements, and the appointing of a commission to carry out this program.

He states also: "I believe the best way to carry out this program would be for Congress to appoint a commission with wide powers, this commission to consist of an equal number of representatives of employers and employees, and that the employers' representatives be appointed by Congress upon recommendation made by such semi-official bodies as the United States Chamber of Commerce. The commission so appointed would select one additional member to act its chairman.

"This commission should have power to revoke licenses given to industrial concerns or to labor organizations, and provide for investigations before strikes or lockouts, and to bring pressure to bear to permit it to arbitrate differences. This commission should be non-political, and the members should be appointed to continue in office for life, subject to certain limitations, similar to those affecting the duties of our Supreme Court.

"They should have all necessary authority and should be strengthened in every way possible, and they should have ample funds to carry on their work of investigation, to employ experts and to make recommendations to Congress on industrial matters. The members of the commission should receive salaries sufficient to permit obtaining the highest possible grade of men, and everything should be done to build up its authority and influence.

"I believe it is of the utmost importance to provide for our taking, in some such way, a middle-of-the-road progressive policy in dealing with the industrial problems so that we will be able to stabilize industry, encourage initiative and enterprise, and at the same time build up a self-respecting, healthy and happy class of employees, all of whom will feel that their rights are carefully safeguarded, and that the avenues of opportunity for betterment of their financial condition are not closed, but that every one has an opportunity of reaching a level commensurate with his own ability, and that at no time will any one who is willing to do an honest day's work be unable to earn a decent living for himself and family."

It is evidently Mr. Guggenheim's idea that both employers and employees should be organized, that all agreements between them should be made as between two recognized bodies of any sort. In other words he would legalize collective bargaining, but make both parties liable to regulation by law.

On the other hand William H. Barr, President of the Lumen Bearing Co., Buffalo, N. Y., and president of the National Founders' Association has placed himself on record again and again in absolute opposition to unionism and collective bargaining. At the 23rd annual convention of the Founders' Association, he stated that "The Open Shop presupposes the principle of Americanism. It permits every man to work for whom he pleases and for what compensation he may elect..... The closed shop, on the other hand, represents an un-American autocracy and a confiscation of property rights."

Here we have two views, which although they may agree in some particulars, nevertheless, differ fundamentally.

The most important problem of the day is undoubtedly labor, and in order to develop a solution to provide some means whereby we could secure industrial peace, it is necessary to know and to understand first; what labor is asking, and second; the reasons for its demands.

It is much too large and complex a problem to settle by any simple expedients. In order to cure our industrial ills we must go to the root of the difficulty. Why is labor discontented? Why have they become such an excellent field for radical propagandists? We confess quite freely that we have no pat answer to this question in spite of the time-honored custom that editors should know and express opinions on everything under the sun. We would rather reserve judgment for a while. We have in our files all sorts of answers and all sorts of remedies clipped from widely varying sources. We hesitate to trust any one of them. It seems to us more than a co-incidence that the answers should vary directly as source from which they come. Hence, we find military men advocating as a cure-all, suppression and deportation of the agitators; employers with a few exceptions advocate open shop and are against collective bargaining; labor men call for recognition of unionism, of the principle of collective bargaining, of the closed shop, and as in the case of the American Federation, they even go so far as to demand that dealings be carried on with no other labor organization but their own. On the other hand the public which is a very indeterminate body, sometimes made up mostly of labor, sometimes spoken of as the middle class or the professionals, advocates plans which suit neither labor nor capital.

Most of the ideas show a deplorable lack of understanding of the other side, which is incidentally a common human failing. Most of the plans for industrial peace are so drawn up as to benefit the class from which they come. Certainly it is not by any class privilege legislation that we shall emerge from our present difficulties. Something broader and more sound must be evolved.

We shall publish from time to time the ideas or schemes of men of different types for comparison and for the information of our readers.

# SHOP PROBLEMS

IN THIS DEPARTMENT WE ANSWER QUESTIONS RELATING TO SHOP PRACTICE

ASSOCIATE EDITORS { JESSE L. JONES, Metallurgical. WILLIAM J. REARDON, Foundry. PETER W. BLAIR, Mechanical LOUIS J. KROM, Rolling Mill CHARLES H. PROCTOR, Plating-Chemical CORYDEN P. KARR, Exchange.

## BATTERY ZINC

Q.—What kind of zinc is used in dry cells? Is this an alloy of zinc or commercial zinc sheets? If an alloy, what would be the composition? Why do they have to be soldered? Can't they be punched or spun or cast? Is there any possible way to cast them in different sizes?

A.—The sheet zinc used in the manufacture of dry batteries is a commercial sheet zinc.

The reason, we presume, that the cylinders are soldered is because it is the easiest method of manufacture. A drawn or spun shell could be used, but in our opinion they would be more costly to produce. You could not cast the shells as thin as sheet zinc. They would not run in the mould. Cost is a factor. The life of a dry battery is too short to use expensive zinc cylinders.

By increasing the thickness you could cast a zinc cylinder in different sizes.—C. H. P. Problem 2,763.

## CASTING

Q.—We find that in casting flat pieces of aluminum, about 10 inches in diameter and half an inch thick, they show up porous when finished. Please advise us.

A.—The alloy that is most commonly used for aluminum castings is composed of aluminum 93 parts and copper 7 parts. It is made up by melting together 86 pounds of aluminum and 14 pounds of an intermediate alloy. This alloy is previously made by melting together equal parts of aluminum and copper and casting into small ingots. In making the intermediate alloy avoid overheating. It is best to melt the copper under a cover of crushed charcoal and add to it the aluminum, a little at a time with constant stirring. An iron stirrer may be used but it should be kept coated with clay wash.

Excessively high temperatures are the most common cause of the porous castings you mention. Most of the large makers of aluminum castings use cast iron pots for melting and gas or oil as a fuel. It is practically impossible with such installations to overheat the aluminum whereas when a deep pit furnace is used, with coke as the fuel, overheating is quite liable to occur. If pit furnaces are used they should be shallow and not hold a very great amount of coke. The iron dissolved from the pots when iron melting pots are used, is now considered as an advantage to the aluminum alloy rather than a detriment.

When rather heavy sections are to be cast in an aluminum alloy, suitable chills should be used if strong, fine-grained castings are wanted. In fact, coarse crystallization should be avoided in castings as much as blowholes.—J. L. J. Problem 2,764.

---

Q.—Please let us have your opinion on the adhesion between a fusible copper-zinc-antimony alloy and a rough sand-blasted steel surface.

A.—The question is not very specific in that the composition of the copper, zinc, antimony alloy is not given. Assuming that this is a zinc base alloy containing comparatively small amounts of copper and antimony, its adherence if poured against a rough sand-blasted steel surface would be merely mechanical. It could probably be jarred loose by blows from a hammer. If poured around a steel pin the alloy by its shrinkage would contract upon the steel very firmly, if it did not crack because of brittleness.

If the steel surface in question is a bearing shell and the zinc, copper, antimony alloy is a babbitt, a good adherence can probably be had by hot galvanizing the steel shell, removing it from the molten zinc while still dripping, placing against a mandrel and pouring the alloy immediately. If it is desired not to galvanize the steel article entirely, the surface to be kept free from zinc could be coated with clay wash or graphite wash.—J. L. J. Problem 2,765.

## CLEANING

Q.—1. Please let me know how we can remove storage grease from steel.

2. What is the best way to cut down and polish brass articles?

3. What is a good bright dip?

A.—Any of the cleaning compounds advertised in THE METAL INDUSTRY pages, when prepared as boiling solutions, or not less than 200 degrees Fahr., will remove storage grease from steel. For the purpose not less than eight ounces per gallon should be used of any materials. Gasoline will readily remove the grease, if the wet type of solutions are to be avoided.

The following formula will also give the results desired:

| | |
|---|---|
| Water | 1 gallon |
| Caustic soda, 74.76 per cent | 4 ounces |
| Soda ash, 58 per cent | 2 ounces |
| Water glass | 1 ounce |
| Powdered rosin | ¼ ounce |

Heat in an iron tank to 200 to 212 degrees Fahr. The addition of caustic soda and soda ash will be required frequently to keep up the activity of the solution.

No. 2. If the articles to be cut down are made from sheet brass it is only necessary to use sewed buffs about 12 inches in diameter and sufficient sections to give a face surface of about two inches. The speed of rotation should be about 2,500 to 3,000 per minute. The polishing medium, a good tripoli or fine emery paste composition.

If the brass articles are in the form of castings, then it will be necessary to emery polish by the aid of either canvas coated emery wheels or wood leather covered and emery coated wheels. Two emery operations will be necessary. The first operation should be with 100 or 120 emery, the second with 200 followed by the final cut down tripoli finish. If a high lustre is wanted it will be necessary to use soft buffs and White Diamond or Acme polishing material for the final finish.

No. 3. To produce a bright finish from the acid dips before polishing the following solution can be used:

| | |
|---|---|
| Nitric acid, 38 per cent | 1 gallon |
| Sulphuric acid, 60 per cent | 1 gallon |
| Water | 1 pint |
| Muriatic acid | 1 ounce |

The articles must be free from grease before immersing in the acid dip. Care must be used in the final drying out to prevent stains.—C. H. P. Problem 2,766.

## COLORING

Q.—Please send me a formula for Flemish brass. Also a formula for a blue-black dip for snap fasteners.

A.—A Flemish brass finish is practically an antique brass finish. The black is a grayish tone. The relieving of the black is done with tampico revolving brushes and pumicestone, practically the same method as in producing brush brass finish.

For an immersion black for the finish you can prepare a solution consisting of:

| | |
|---|---|
| Water | 1 gallon |
| Sodium cyanide | 12 ounces |
| Caustic soda | 4 ounces |
| White arsenic (powered) | 4 ounces |

Use the solution at 200 deg. Fahr. Dissolve the caustic soda and arsenic separately in as little warm water as possible, and then mix with the sodium cyanide.

A solution can also be prepared as follows which will give similar results:

Dissolve by the aid of heat all the white arsenic, commercial muriatic will absorb. Keep this as a stock solution. Add one or two ounces per gallon of hot water or more if necessary until a bright grayish black is produced, when the articles are immersed for a minute or two. Then remove, wash, dry and finish

as outlined. It is sometimes found advisable to add a small amount of free muriatic acid to the water from ½ to 1 ounce per gallon in addition to the amount of arsenic and muriatic acid specified.

All Flemish Brass finishes should be finally lacquered.

No. 2 cold dips do not give as satisfactory results as warm or hot dips do. The ammonia carbonate solution gives the most satisfactory blue black for snap fasteners. Before proceeding to coat the fasteners they must be clean and bright and preferably acid dipped using the usual mixture of sulphuric and nitric acid for the purpose.

The black dip should be prepared as follows: In 26 per cent aqua ammonia water dissolve all the pure copper carbonate the ammonia will absorb. Allow the solution to settle. The clear solution should be used.

To every gallon of ammonia copper carbonate solution so prepared add eight ounces of crystal carbonate of soda dissolved in a quart of warm water and mix with the ammonia solution. For the best results the solution should be maintained at not less than 120 deg. Fahr.

After the fasteners have been blackened wash thoroughly, immerse for a second or two in any cleaner you may use, that is used for removing grease, brass, etc., and then rewash and dry.

The immersion after blacking the fasteners, in cleaners prepared from either caustic soda and soda ash or any of the prepared cleaners sets the black and prevents stains.—C. H. P. Problem 2,767.

## COPPER PLATING

Q.—Please let us know how we can copper plate castings.

A.—If the composition of the metal had been given it would have helped materially in giving a satisfactory formula.

For copper plating, however, the following formula is adapted to plate most commercial metal except aluminum:

| | |
|---|---|
| Water | 1 gallon |
| Sodium cyanide, 96.98 per cent. | 4½ ounces |
| Copper cyanide | 4¾ ounces |
| Bicarbonate of soda | 2½ ounces |
| Hyposulphite of soda | ⅛ ounce |

Temperature 120 degrees Fahr. Voltage 3½. Amperage 15 to 20 per square foot of surface.

As this is the maximum of amperage that can be used it might be advisable to use less, say 8 to 10 amperes, to produce a ductile adherent copper deposit. The usual methods of cleansing will have to be carried out before plating.—C. H. P. Problem 2,768.

## LEAD COATING

Q.—We have had under consideration the lead coating of the container of our apparatus with lead by the hot process. The purpose being to protect the black sheet metal from corrosion.

The Underwriters' Laboratories have informed us that all the leading coating that they have ever inspected have shown such a prevalence of "pin-holes" that they could not pass such construction.

Can this objection be surmounted?

Where can we get full information on the subject?

A.—The coating of metals with pure lead is more difficult than one containing some tin, especially by the hot or molten method. It is possible, however, that after coating by the hot process if the articles were plunged in molten tallow the metal would be rendered more fluid due to the action of the tallow as a flux. Pinholes should not then develop. The black sheet metal must be perfectly clean and free from scale or oxide. The acid in the pores of the metal should be neutralized by immersing after pickling and washing in water in a hot solution composed of:

| | |
|---|---|
| Water | 1 gallon |
| Sal ammoniac | 4 ounces |

As a flux for the lead immerse the sheets or articles in a solution composed of:

| | |
|---|---|
| Water | 1 gallon |
| Sal ammoniac | 8 ounces |
| Bichloride of mercury | 2 ounces |

It is possible that electro-deposits of lead would answer your purpose better.

The fluo-silicate lead solution gives excellent results. See THE METAL INDUSTRY past issues for data.—C. H. P. Problem 2,769.

## MELTING

Q.—I would like to find out if you can tell me about my trouble. I use mostly 80 copper, 10 tin, 10 lead, also 92 copper, 5 tin, 3 zinc. Formerly I used coal with a draft furnace. I had always my metal well covered with charcoal and the metal was always satisfactory. Recently I bought a Geist furnace and a Maxon Premix burner so now I melt with gas. The furnace is just an ordinary furnace, gas and air coming in at the side of the furnace and striking the crucible at the bottom. The metal is melted more quickly but sometimes it oxidizes. I cover it with dry sand as it is melted, but if the metal stays too long it burns or oxidizes. I use blue glasses to look at it but it is not easy to tell when the metal is ready. I have to work by guess; I figure so much time for each heat but that is not very practical.

A.—Your trouble is possibly overheating and possibly in addition oxidation. It may be that you use too much air with your gas. As you state the metal is melted more quickly, it will be necessary to watch it more closely. It should be removed from the crucible and not allowed to soak in the furnace. You do not state whether you keep your metal covered with charcoal at the present. It would certainly be well to do so.

So far as judging the temperature is concerned the only certain way to know when your metal should be poured is by the use of a pyrometer. If you cannot afford this you will simply have to keep on working with your furnace until you have learned to recognize the metal at the proper temperature. Eventually you will be able to tell by the time, as you state that you are trying to do now, but that will come only after you have become thoroughly acquainted with your furnace and the different alloys which you melt in it.—A. B. Problem 2,770.

## MONEL METAL

Q.—We have a Monel Metal Water Box, weighing 1700 pounds, to make and would like to know the best way to handle the metal in getting it hot, and if it is difficult to cast. Also would like to know what flux to use and whether it would be better to buy the metal already mixed?

A.—While considerable has been written recently regarding the manipulation of "Monel Metal" from crucible to mold, the various writers have so far failed to be entirely accurate in their instructions. With a view of correcting any erroneous impressions that may be formed we publish the following account of the correct method for producing castings of "Monel metal," quoting from an article in THE METAL INDUSTRY, January, 1910:

The instructions are approved by the manufacturers of Monel metal, the Orford Copper Company, and if they are consistently followed no difficulty will be experienced in getting the very best results.

"Monel metal" crucible stock is the metal in the form of shot or small blocks, specially prepared for crucible work. Clay-lined crucibles must be used and when charged with the proper amount of "Monel metal," a cover is placed over the crucible. No flux, charcoal, or other material should be added to the metal while melting. "Monel metal," melts rapidly and can be raised to a high temperature without injury. The proper melting temperature is a little higher than cast iron (say 2480 deg. F.) When the proper temperature is obtained, the crucible is taken from the furnace and metallic magnesium added at the rate of 1½ ounces to every hundred pounds of melted metal. The magnesium is placed in a retainer or tongs, pushed to the bottom of the crucible as quickly as possible and carefully stirred. The metal can be cast either in dry or green sand molds, on the same general plan as casting manganese bronze, though the heating of this metal is high so that the sand selected should be of a nature to stand this heat. It is especially desirable to have a sand as high in silica as possible and free from oxide of iron or lime. For the production of the finest light castings, it is advisable to take raw sand and burn it and then carefully mix it with a diluted solution of molasses water and surface dry the mold, then smoke the surface of the mold with

either resin or coal tar. It is also absolutely essential to allow for liberal risers."—A. B. Problem 2,771.

## NICKEL PLATING

Q.—In connection with our product, i.e., dress fasteners. We are looking for information relative to finishing same. If you are in position to advise us or can suggest some publication which will help us, we shall appreciate your assistance. When these goods come from our machines they are first tumbled to smooth them up, take off the burrs, etc. We are using a Baird tumbling machine, with cast iron barrel, together with maple blocks and leather chips. We know that some use sawdust, but we prefer not to do so if we can avoid it.

A.—The following manipulations are required to produce a bright lustre finish upon dress or snap fasteners:

1. Removal of oil by immersing in a hot cleaning solution (200 deg. Fahr.) composed of:

| | |
|---|---|
| Water | 1 gallon |
| Caustic soda, 76 per cent | 3 ounces |
| Soda ash, 58 per cent | 3 ounces |
| Silicate of soda | 1 ounce |
| Sodium cyanide | ½ ounce |

A few moments immersion in this cleaner will produce a clean surface.

2. Wash in cold water after cleaning, and then tumble to remove burrs, etc. Some firms prefer to tumble in pumice stone and water to which some sawdust, preferably maple, is added.

3. After tumbling, wash in water and bright acid dip. The bright dip is composed as follows:

| | |
|---|---|
| Nitric acid, 38 per cent | 1 gallon |
| Sulphuric acid, 66 per cent | 1 gallon |
| Muriatic acid | 2 ounces |
| Water | 1 pint |

4. After dipping re-wash in cold water and tumble in warm water to which is added per gallon of water 1 ounce Proctor & Gamble's soap chips, and one ounce tri-sodium phosphate. It is advisable to use steel balls, with small spikes. The points extended from the ball burnish the inside of the fastener, which is so much desired.

5. Some firms prefer to tumble for final finish in a solution consisting of water 1 gallon, acid sodium phosphate 1 to 2 ounces. After tumbling with a light cleaning in a mild alkali cleaner, the fasteners are ready for tinning or nickeling. These methods cover the latest practice for finishing this class of goods, and others of a similar nature.—C. H. P. Problem 2,772.

## SOFT SOLDER

Q.—We have encountered considerable trouble in the manufacturing of our Solder. The bars seem to spot very much. Will you kindly advise us how to eliminate these spots and just what is the cause?

A.—There are several causes for spotting of solder. It may be due to impure metal, to an excessive amount of antimony or to casting at too high a temperature. In order to avoid these difficulties the metal should be thoroughly cleaned before casting, and the antimony should not under any circumstances run over 1½ to 2 per cent. The metal should be cast at a temperature only a little above its melting point.

We can refer you to an article in THE METAL INDUSTRY, February, 1916, on the Manufacture of Soft Solder from Scrap Metals.—A. B. Problem 2,773.

## SILVERING GLASS

Q.—Please tell me how I can put a silver plate upon glass bottles.

A.—It requires considerable experience to produce a successful deposit of silver upon glass such as is applied to the inside of thermos bottles, or rather on the outside of the glass container.

The glass to be silvered must be perfectly clean. Quite frequently it is found necessary to immerse the glass in a 10 per cent. solution of nitric acid and water to remove impurities from the surface of the glass. Usually, however, denatured alcohol will cleanse sufficiently.

The solutions used in connection with the method should be prepared as follows:

1. Stock solution,

| | |
|---|---|
| Nitrate of silver c. p. crystals | 3 ounces |
| Aqua ammonia, 26 per cent | 2 ounces |
| Distilled water | 20 ounces |

Dissolve the nitrate of silver in a portion of the water previously heated, then mix together. It is advisable finally to filter the solution.

2. Reducing solution,

| | |
|---|---|
| Tartaric acid crystals | 1 ounce |
| Distilled water | 5 ounces |

3. Sensitizing solution,

| | |
|---|---|
| Chloride of tin c. p. crystals | ⅛ ounce |
| Distilled water | 10 ounces |

4. Silvering solution, prepared for use,

| | |
|---|---|
| Stock solution No. 1 | 1½ ounce |
| Distilled water | 16 ounces |
| Reducing solution No. 2 | ⅛ ounce |

Keep the stock solution in a dark glass bottle. It should be well mixed before using.

To silver the glass in whatever form, cleanse thoroughly as outlined. Upon a warm plate place sawdust to the depth desired to hold the glass bulb or bulbs in an upright position. The temperature of the sawdust should be about 120 degrees. After cleansing the bulbs wash in distilled water. Then pour in some of the sensitizing solution No. 3. The solution is prepared from

| | |
|---|---|
| Distilled water | 1 quart |
| Sensitizing stock solution | 15 drops |

Remove the sensitizing solution in a moment or two, and then fill up the bulbs with the silvering solution No. 4, place upon the warm sawdust and let remain until the silver has deposited upon the glass, which will be in a short time. Then remove the solution into a separate bottle. It contains some silver, but cannot be used again.

Wash very carefully after silvering. Sometimes a lacquer is applied to the silvered surface to protect it against oxidation. Any dilute solution of collodion lacquer will answer the purpose.—C. H. P. Problem 2,774.

## PICKLING

Q.—I have a problem on pickling that I would like to have some advice on. It is sheet iron, 6 ft. by 4 ft., and it has a heavy scale on it. I have to remove the scale before it is run through the punch press to protect the die. I am using sulphuric acid and water. Do you think that is the proper pickle? How can I dry it so as to avoid the rust? Will a wood tank lined with lead be proper to keep the solution in?

A.—A good hot pickle consisting of water 1 gallon, sulphuric acid ½ pound, heated to 160 or 180 degrees Fahr. will rapidly remove the fire scale.

The mixture should be contained in wood lead lined tanks. The seams must be burned in, not soldered. Lead coils must be used for heating with steam.

The following solution also gives excellent results:

| | |
|---|---|
| Water | 1 gallon |
| Edis compound* | 1 pound |
| Hydrofluoric acid, 30 per cent | 2 ounces |

*Note.—Edis compound is commercially known as nitre cake. It is a by-product, an impure sodium bi-sulphate.

Many platers or those who have to do pickling of cast or malleable iron or hot rolled steel, claim hydrofluoric acid gives the best results. The following formula will prove satisfactory:

| | |
|---|---|
| Water | 1 gallon |
| Hydrofluoric acid, 30 per cent | 2 pounds |

Heat should be used as noted to prevent the steel rusting. After pickling, wash in cold water, then immerse in a boiling water to which is added per gallon of water:

| | |
|---|---|
| Soda ash, 58 per cent | 1 ounce |
| Slacked lime | 3 ounces |

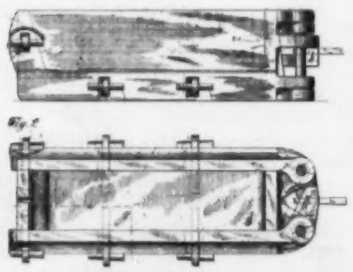
Do not rewash in water. The lime should dry on the steel.—C. H. P. Problem 2,775.

# PATENTS

## A REVIEW OF CURRENT PATENTS OF INTEREST

1,313,259. August 19, 1919. **Removable-Sided Ingot Mold.** Ray G. Coates, Pasadena, California, assignor to Valley Mould and Iron Corporation, Sharpsville, Pa., a corporation of New York.

The principal object of the present invention is an ingot mold provided with removable portions and so constructed that the parts may be standardized in such manner that corresponding parts of different molds are interchangeable, whereby economy in manufacture and labor is facilitated.

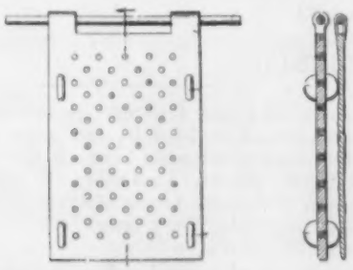


A further and equally important object of the present invention is an ingot mold of the character specified, wherein the sides of the ingot preferably are without draft whereby the ingot may be more readily treated by rolling or forging than if the sides were tapered or inclined, and wherein one end of the ingot is adapted to be at substantially right angles to the axis of the ingot so that the said ingot may be set in an upright position in a soaking pit.

---

1,313,246. August 19, 1919. **Electrolytic Process and Anode.** Frank L. Anthsell, Perth Amboy, New Jersey.

This invention relates to electrolytic processes and to anodes suitable for use in the electrolysis of metalliferous solutions, particularly solutions containing copper such as those obtained by leaching copper bearing ores with solutions of dilute sulfuric acid.



The anodes of this invention relate particularly to those of the so called insoluble type which are not attacked by the anion set free during the electrolysis.

Another object of this invention is to prevent or greatly decrease the occurrence of undesirable secondary reactions at the anode and thus do away with the necessity of using depolarizing chemicals. Another object is to construct the anodes in such manner that they and the corresponding cathodes can be placed close together whereby the power required for the recovery of the metal from the solution is decreased and the capacity of a deposition tank increased. Another object is to so construct the anode that during the operation of the process the formation of eddy currents or an increase of circulation on the surface of the anodes will be minimized to such a degree that they will be practically effectively prevented and thereby eliminated. Another object is to construct a cheaper anode when an expensive metal must be used to withstand the action of corrosive acids in solution.

---

1,314,417. August 26, 1919. **Alloy.** Foster Milliken, Lawrence, N. Y.

This invention relates to an alloy, the basis of which is made up of copper, nickel, iron and zinc, with which are mixed certain other metals, whereby the alloy is capable of being rolled, forged, drawn or worked in other ways while the metal is hot. Heretofore alloys of this character, as far as I am aware, have had to be worked by the cold process, that is to say, by annealing from time to time and then working while cold. This alloy can also be worked cold.

In addition to the new alloy being adapted for hot working and cold working it has the further advantage of being highly resistant to acid. The alloy comprises:

| | |
|---|---|
| Copper | 40—48 per cent. |
| Nickel | 8—12 " " |
| Zinc | 38—48 " " |
| Iron | 1—6 " " |
| Manganese | 1—2 " " |

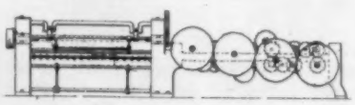
A test of the new alloy and cold rolled alloys with a 15 per cent. sulfuric acid solution resulted as follows:

| | Hot rolled. | Cold Rolled. |
|---|---|---|
| Original weight of sample | 21.7280 grs. | 11.6360 grs. |
| Weight one week after | 21.7186 " | 11.6226 " |
| Loss in seven (7) days | .0094 " | .0134 " |
| Surface exposed | 2.25 sq. in. | 3.15 sq. in. |
| Loss per square inch | .00425 grs. | .00418 grs. |

---

1,314,286. August 26, 1919. **Sheet-Metal-Cutting Machine.** Harold H. Spang, Leechburg, Pa.

This invention has for its object to provide an improved and simplified cutting machine, whereby large sheets of sheet metal or other material may be expeditiously cut into strips of any desired length and width.

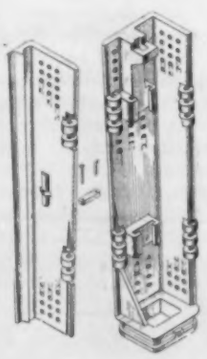


With this and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

---

1,313,983. August 26, 1919. **Collapsible Core for Ingot-Molds.** Ray G. Coates, Pasadena, California, assignor to Valley Mould and Iron Corporation, Sharpsville, Pa., a corporation of New York.

The principal object of the present invention is the production of an efficient large collapsible core for use in making ingot molds.



A further object of the present invention is a collapsible core of the character specified wherein the joints liable to be filled with sand are constructed to expand or enlarge when the core is collapsed thereby obviating the necessity of crushing baked sand.

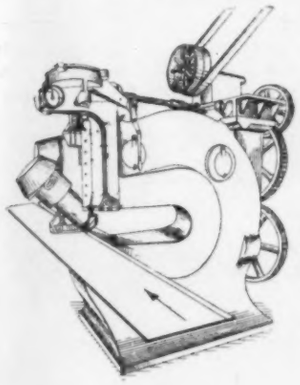
A still further object of the present invention is a collapsible core of the character specified and adapted to be rigid when positioned on either end and to be capable of being transported and moved without breaking the sand facing which covers the core when ready for use.

---

1,313,960. August 26, 1919. **Shears.** Henry Collier Smith, St. Marys, Ohio.

According to the present invention, the operator at the machine keeps a pointer or needle constantly on the line of the desired cut, which is scribed or marked on the material,

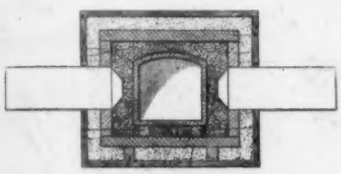
and by so doing controls an indicator within view of the workman at the end of the sheet; any angular departure of the marked line from the position it should occupy to insure the proper cutting action is thus constantly shown and the workman has therefore only to watch the indicator and to shift the sheet to the right or left as may be necessary to position the indicator arm or its equivalent at a predetermined point, corresponding to the proper position of the line. That is, the operator watches the marking line and holds the pointer thereon and need pay no attention to the cutters once the sheet is properly entered, and the workman pays no attention to either the cutters or the operator, but keeps his eyes on the indicator and shifts the end of the moving sheet just enough to hold the indicator true to its neutral position. The process is thus continuous and has in practice proved decidedly advantageous both in quality and quantity of the output.



---

1,313,985. August 26, 1919. **Electric Furnace.** John Fitzpatrick and Levi Thurston Stephens, Niagara Falls, N. Y., assignors to The Carborundum Company, Niagara Falls, N. Y., a corporation of Pennsylvania.

The invention relates to electric furnaces and more particularly to electric resistance furnaces suitable for the heating, hardening and tempering of small metal parts and for other purposes requiring a close regulation of temperature in a neutral or reducing atmosphere.

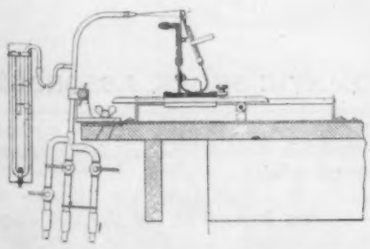


The object of the invention is to provide a furnace of the character herein described in which a high temperature is obtainable without rapid deterioration of the furnace. With this object in view, the present invention consists in the electric furnace hereinafter described and particularly pointed out in the claims.

---

1,314,422. Aug. 26, 1919. **Apparatus for Ascertaining the Fusing Temperature of Materials.** Zacharias Olsson, Brooklyn, N. Y.

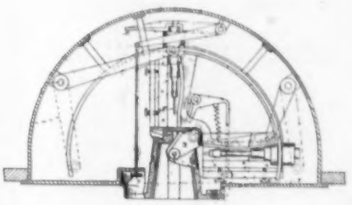
The apparatus herein disclosed is particularly useful for ascertaining the deformation temperature and fusing point of clays, other minerals and metals. These determinations have heretofore usually been made in electric furnaces and the temperatures either compared with Seger cones or directly ascertained by pyrometers. Both methods, however, are cumbersome, slow and not very accurate, because of the difficulty in observing the starting moment of deformation and fusing.



These difficulties and objections are overcome when using the improved apparatus herein described, where the specimen being tested is under close and continuous observation until the temperature is reached at which the physical condition of the specimen changes. The adjustment of the apparatus necessary to reach this particular temperature is at the same time mechanically recorded.

1,314,954. September 2, 1919. **Molding Machine.** William J. Tiegel, Detroit, Mich., assignor to General Aluminum & Brass Mfg. Company, Detroit, Mich., a corporation of Michigan.

The invention relates to molding machines of that type adapted especially for use in forming one-part molds for test bars. It is necessary to secure test-bars having a portion intermediate its ends of constant cross-sectional area and it is highly desirable to secure a casting having this construction without the necessity of performing a machining operation. One of the objects of the invention is to obtain a construction for forming a cavity in a one-part mold having a portion throughout its length of constant cross-sectional area.



---

1,315,011. September 2, 1919. **Process of Making Titanium Oxide.** Elton R. Darling, Montclair, N. J., assignor by direct and mesne assignments to Essex Laboratories, Inc., a corporation of New York.

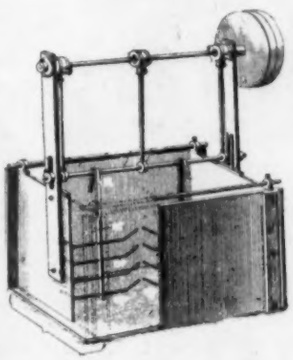
This invention relates to a process of making titanium oxide from rutile or other titaniferous ores, preferably from those with a comparatively high titanium oxide content.

In carrying out this process one may proceed in the following illustrative manner: A quantity of finely powdered rutile, preferably of about 120 mesh, is exposed to a heat of about 125° centigrade or above, preferably 150° centigrade, in the presence of chlorine gas, thus forming the chloride of titanium in a volatilized condition, which is then passed into a boiling solution of glucose, whereby the oxide of titanium is formed, leaving as a by-product a solution of glutaric acid which is valuable for certain commercial purposes. The oxide of titanium is then filtered, washed and dried.

---

1,315,029. September 2, 1919. **Electroplating Apparatus.** David Allen Metz, Philadelphia, Pa.

This invention relates in general to solution-stirring apparatus applicable to electrolytic tanks for refining metals by producing agitation and electro-deposition, and relates more particularly to and comprehends a novel means for effecting the agitation of the electrolyte which can as a unitary structure be applied to tanks of different dimensions and construction.



It is well known that a controlled and active circulation of the electrolyte in the refining or plating tank is a desirable feature as tending to produce smooth and even deposition upon the cathode, and this invention comprehends an organized unitary mechanical apparatus for agitating or stirring the solution in a simple, cheap and effective manner in any type of tank provided with the necessary anodes and having the usual electrical connections.

---

1,315,017. September 2, 1919. **Method of Preventing Steel from Rusting.** James H. Gravell, New York, N. Y.

One of the known methods of treating steel to prevent it from rusting consists in subjecting the steel to the action of phosphoric acid and then painting it; the phosphoric acid destroys or removes soldering, fluid, perspiration from the hands, etc. That method is satisfactory, but requires skill in its operation owing to the fact that the syrupy phosphoric acid used is a liquid and consequently care must be exercised in removing all this liquid before the paint is applied.

# EQUIPMENT

## NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST

Many of the machines shown this month were exhibited at the Foundrymen's Convention in Philadelphia, in September, 1919. The delay in publication is due to the printer's strike.

## AJAX METAL COMPANY'S EXHIBIT

The special feature was the 60 KW Ajax-Wyatt Electric Furnace which was shown to the public for the first time. Over one hundred (100) of these furnaces have been sold with satisfactory results, without one inch of advertising space. This furnace attracted great attention and many of the visiting foundrymen called at the Ajax plant, Richmond Street and Frankford Avenue, to observe the furnaces in operation. The furnace on exhibit will melt 600 pounds of Yellow Brass in one hour, with small loss in metal and a saving of labor. The heat is under control and the metal product is homogeneous. The name "SHURGRIP" has been given to the Yellow ingots because of the depression in the ingots in which the tongs fit, preventing the ingots from slipping from the tongs.

The balance of the Ajax exhibit consisted of three pyramids; two of these contained a display of Ajax Standard Ingot Metals; in connection with each ingot was a polished piece showing the color, and test bar to give the physical properties of each alloy, and smaller castings shipped by users of Ajax-Process Ingots to show the excellent quality of the castings that can be produced from these ingot metals. The third pyramid contained a display of Ajax Babbitt Metals with the Ajax Bull Bearing Alloy as the principal feature. Larger Castings of various kinds made from various ingot alloys were displayed upon the aisle.

The color effect was red, which contrasted with a display of evergreens; and comfortable wicker chairs for their many friends, for the balance of the space.

THE AJAX EXHIBIT AT THE FOUNDRYMEN'S CONVENTION, PHILADELPHIA, SEPTEMBER 30-OCTOBER 4, 1919.

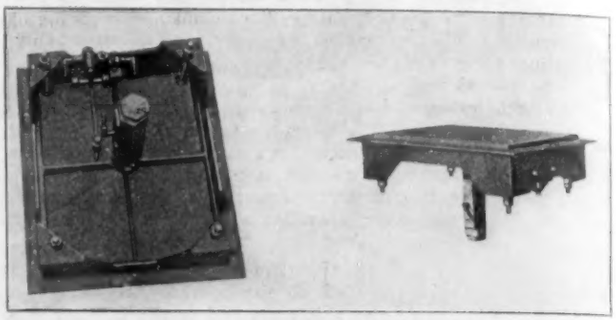
## BRANFORD VIBRATOR CORE BENCH

This is an all metal bench, lightly and strongly built and contains the following new features:

In the center of the bench near the forward edge is placed a frame carrying a spring supported platen. This platen carries, attached to its under surface, a pneumatic vibrator of a size sufficient thoroughly to vibrate the platen when in operation.

The controlling valve of the vibrator is so connected that a slight downward pressure on the platen opens the valve and starts the vibrator.

In operation, the operator having made the core, simply presses down on the core box starting the vibrator and gets the necessary vibration to free the core from the mother box, which is removed, leaving the core in the drier.



TWO VIEWS OF THE CORE BENCH.

By the use of this bench, it is stated that all pounding on the core boxes is eliminated, and breakage and sprung boxes from this cause cease to be a factor.

The vibrator platen can be furnished for benches already installed. It is manufactured by the Malleable Iron Fittings Company, Branford, Conn.

## THE RHINE AUTOMATIC SHOCK ABSORBER

Air ramming is a great improvement over the old method of hand ramming, but the shock caused by it to the operator has reduced its efficiency materially.

The Rhine Shock Absorber is designed for the purpose of eliminating this entirely—making it possible for the manufacturers to use their present air rammers and placing it on them without any trouble, so that the molders will have a shockless air rammer to work with.

It is impossible for a molder to operate an air rammer without stopping every few moments to recover from the constant vibrations it causes—this, of course, means loss of time and money.

The Rhine Shock Absorber not only absorbs the shock, but is furnished with a device for shutting off the air.

It can be attached to any air rammer. It is sold by the J. S. McCormack Company, 2428 Railroad St., Pittsburgh, Pa.

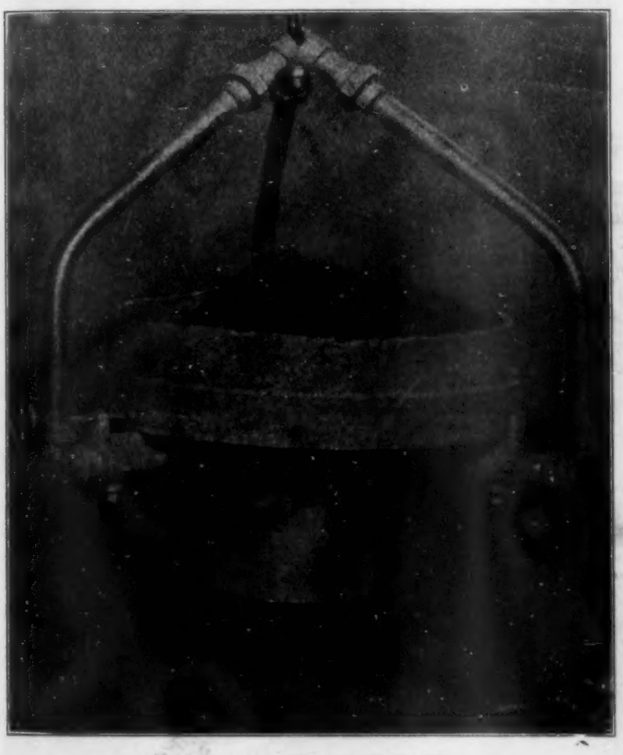
## THE SANDHOG

The essential advantage claimed for this screening device is capacity, which is the result of its unusual construction in applying the vibrating power to the screen only.

The motor is so designed, that the outside—housing and field—revolves. It has the action of an eccentric fly-wheel. This type of construction is a patented feature of the Sandhog, and accounts for its great capacity in combination with its light construction. No one man with a shovel, can fill up a Sandhog with mounding sand, while it is in motion.

It weighs 40 pounds, is small in size and easily adjusted to any height desired. It is furnished with motors of 1/6 horsepower, either A. C. or D. C. type. Ten feet of insulated cord and a standard plug, to fit any ordinary lamp socket, are furnished with every machine. It is provided with lugs which can be adjusted to suit any standard riddle, up to 20 in. By the turning of a screw, provided with a hand-wheel, riddles may be inserted or removed in an instant.

Where wooden riddles are used, an adjustable steel band



THE SANDHOG LOADED UP.

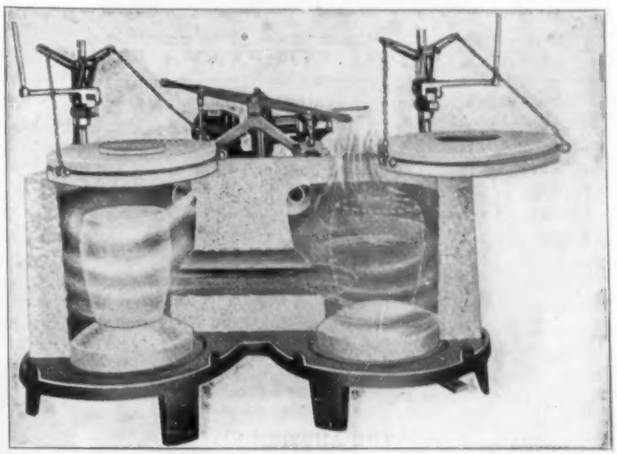
can be furnished, to avoid bulging of the riddle, or sagging of the screen.

Manufactured by the Vibrating Machinery Company, Chicago, Ill.

## MAXON DOUBLE CHAMBER FURNACE

This furnace is supposed to be practically two in one, being connected by means of a heat channel at the bottom. One chamber is fired at a time and the waste heat from this passes through the heat channel into second chamber. By the time metal in first chamber is ready to pour, metal in second chamber is melting. The direction of the heat is then reversed by closing the blast gate valve into the first chamber, which mechanically opens the valve into the second chamber, which is then fired, bringing the metal to the melting point while the first charge is being poured and first chamber being refilled with metal, then this is heated by means of the waste heat from the second chamber. The following advantages are claimed:

1st. A pot of metal every 30 to 40 minutes.
2nd. A fuel economy.
3rd. Low percentage of shrinkage.
4th. No crucible rest block.
5th. Crucible will not fuse nor stick to bottom of furnace as nozzles enter at top.



AN IDEAL SECTION SHOWING THE PATH OF THE FLAME.

6th. Ease of cementing in nozzles and inspecting same.
7th. Increased crucible life, flame is divided, fired at the bottom then at the top.
8th. Slag holes protected and large enough for convenient use.
9th. Dump bottom in case pot breaks.
10th. Cover lifting devices that are practical.
11th. Furnace construction gives proper distribution of the heat, insuring maximum use.
12th. Combustion of the fuel takes place in the furnace where you need the heat to do the work.
13th. Average Heats per day 12.

Manufactured by the Maxon Premix Burner Company, Muncie, Indiana

## AMBRINE TREATMENT FOR BURNS

Burns have always been most serious and costly hazards in the Metal Industries. One of the basic principles in the treatment of burns has been to exclude the air from the wound, but although this cardinal principle has been known for centuries, not until Barthe de Sandfort discovered the Ambrine Treatment was there anything known in medicine to meet this requirement.

SEVERELY BURNED.

HEALED.

While Dr. Barthe de Sandfort, an unknown French Naval Surgeon, was working in the field hospital of France, he discovered the Ambrine Treatment for burns and surface wounds, a treatment for rebuilding the tissues and skin after they have been destroyed by fire, gas, explosions, hot metals, chemicals and other causes.

When the United States entered the War, Ambrine Laboratories were established in this country, and more than 22,000 pounds of Ambrine a week was used by the American Ex-

peditionary Forces alone. Today the lessons of the war are being carried into the peace-time industries, and in no other industry is this war discovery more valuable than in the Metal Industry.

It is claimed that the burns from hot metals which usually

THE AMBRINE KIT.

take months to heal, heal in a week or two with this Ambrine Treatment. Disfiguring scars and loss of function are practically eliminated, therefore much compensation is saved.

Ambrine Emergency Cases for Foundries and Plants with complete apparatus for the proper and easy application of Ambrine can be obtained from the Ambrine Laboratories, 347 Madison Avenue, New York, N. Y.

## THE WIEDERWAX PREHEATER

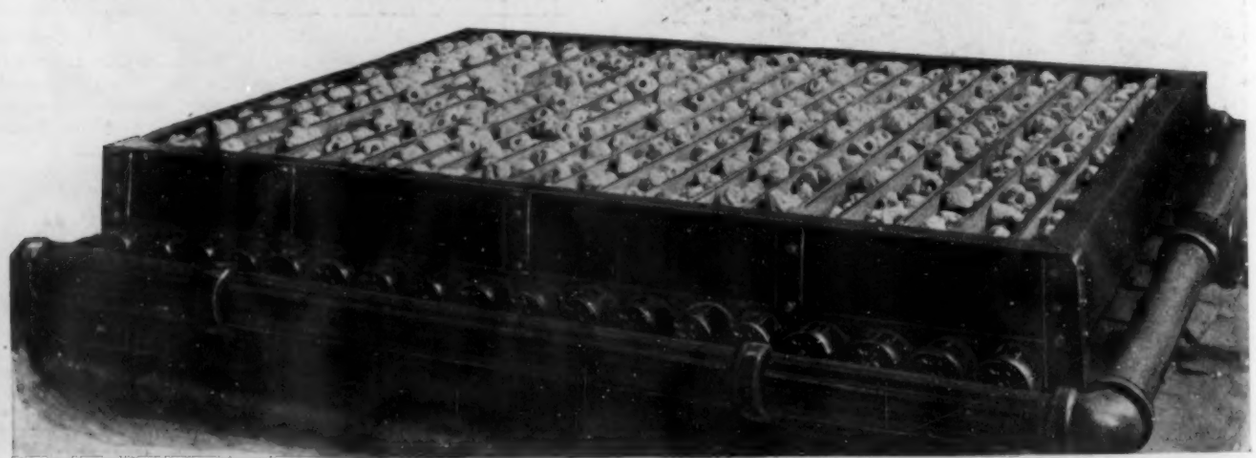
The Wiederwax Preheater is a general continuous heating medium using for fuel, artificial or natural gas, or gasoline. It is square in shape, with a large flat table-like surface. The top consists of a heavy metal grating between the bars of which is placed a special heat-absorbing element reaching downward to a depth of about six inches. This heating element absorbs the heat furnished by a series of specially constructed burners, and distributes it over and through itself, until it becomes a cherry red all over, thus giving off a soft radiant heat the temperature of which is the same at all points of the heating surface and which is controllable.

The burners supplying the heat are placed in rows, each row running from the side to the center, from each side, and each row controlled by its own valve. This arrangement makes it possible to use any number of burners, and thus, any part of the heating surface desired either in width or depth.

Immediately beneath the burners is the cooling oven the ceiling of which is formed by a series of perforated pipes, whose open ends run outward through the sides of the preheater, just between the burner valves. As soon as they become hot, from the fire over them, air is automatically circulated through them, heated, and radiated into the oven underneath.

FOUR JOBS BEING PREHEATED AT ONE TIME, USING DIFFERENT DEGREES OF HEAT.

This oven is square and roomy and is provided for the cooling of finished jobs. It retains a heat ranging downward from 500 F., according to the number of burners in operation, is free of all draught, and reduces the heat of the finished piece with a slow, even contraction, thus removing the danger of warping and cracking. Below are comparative figures published by the manufacturers of the Wiederwax Preheater.



THE WEIDERWAX PREHEATER—FLOOR MODEL.

WIEDERWAX METHOD

The Job: Harris Marine Engine, 45 h. p., 3 cylinders, 7½ in. bore, size 37 in. x 15 in. x 20 in.

No. of Welds: Five.

Time to Preheat: One hour.

Time to weld: One and a half hours.

Time to coal: Three hours.

Cost of preheating: 750 cubic feet of gas at $1.00 per M cubic feet, or 75c.

Total time: Five and one half hours.

CHARCOAL

The Job Harris Marine Engine, 45 h. p., 3 cylinders, 7½ in. bore, size 37 in. x 15 in. x 20 in.

No. of welds: Five.

Time to preheat: Three hours.

Time to weld: One and a half hours.

Time to cool: Forty-eight hours.

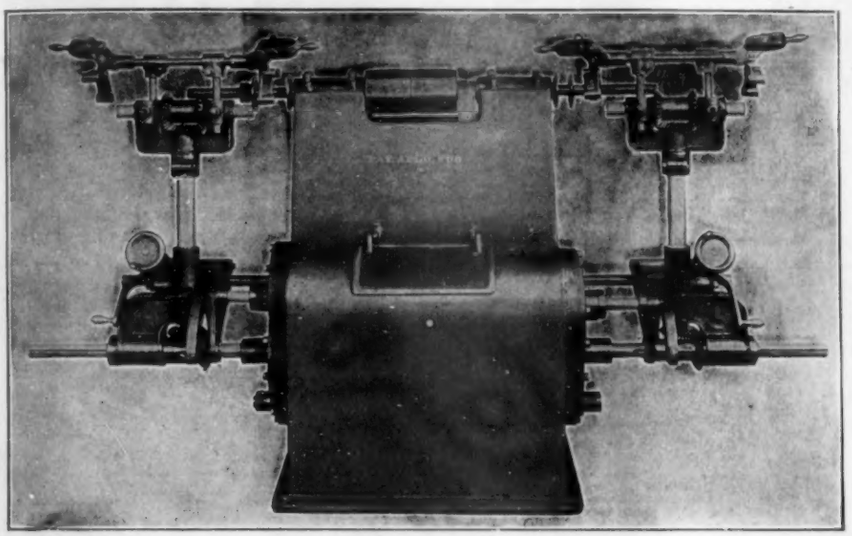
Cost of preheating: $3.00.

Total time: Fifty-three and a half hours.

This preheater is manufactured by the Geist Manufacturing Company, 2001 Atlantic Avenue, Atlantic City, N. J.

## DUPLEX BUFFING MACHINE

This machine is driven from a line shaft in the buff room by a five-inch belt to pulleys the same as are ordinary buffing lathes. One operator operates both ends of machine which has a buff on each end of spindle. There are four work spindles, with suitable chucks to receive the work to be buffed.



A FULL VIEW OF THE MACHINE.

The operator places a piece of work on each of the two outside chucks, then pulls down a lever which clamps the work tightly. He then pulls down a lever which swings a radial arm forward, thus engaging the work with the buff, after which he repeats this operation and a lever is pulled by bringing the radial arm back, pulling a latch pin and allowing the column to revolve 180 degrees. Then the lever is pulled down again, thus bringing the other pieces in contact with buff.

Two pieces are being buffed while the operator is placing the work on the other two chucks. There is an adjusting screw to compensate for wear of the buff. A locking screw to adjust spindles for buffing taper or inside work, main drive pulleys loose and tight, a belt jack shaft through which the work spindles are driven by clutches with right and left-hand spiral keyways adjustable to any length up to 10 inches long.

The work holder is designed to eliminate the use of expanding chucks. It operates easily and fast, puts the pressure where it is most needed by increasing the leverage as it nears the work. It is adjustable to any pressure required. The machine has no overhead countershafts and is easily installed.

It is made by the Duplex Buffing Machine Company, Buffalo, N. Y.

## THE KLAXOCATOR

Within the last few years, under the impetus of the pressure for an enormous increase in the production of munitions, audible electric signal systems have been introduced in many metal works whereby any important man may be located instantly wherever he might be.

Such a system consists of a Klaxocator—usually placed near the telephone operator—and a number of electric signals so scattered through the works that when sounded they are heard everywhere at all times. The Klaxocator automatically operates these signals in such a manner as to sound various code signals.

Each important man in the works is assigned a code signal corresponding to a number on the Klaxocator Dial. When a man is wanted the switchboard operator turns the dial to his number and pulls a lever. The proper signal is sounded in every part of the plant to tell him he is wanted. He lifts the nearest telephone receiver and is connected by the operator to the man who wants him. As many as 40 men may be located in this way.

A locating system saves a great deal of time for executives who have to get in touch with each other many times a day and for workmen who were formerly continually disturbed—either by messengers or by the telephone operator—with questions as to the whereabouts of this or that man.

The Klaxocator may be used to sound fire alarms, signals for starting and stopping work and special code messages. In the quiet offices of a plant musical chime bells or buzzers may be used to sound signals. In the departments where the noise is moderate bells and gongs are sufficient. But in the noisy departments of a steel plant—in the rolling mills, in the molding, cleaning and trimming, sand mixing, melting, core and welding departments of a foundry the noise is severe and in such places Klaxon horns are most often used. These horns are similar in construction to the automobile horns, being electric motor driven, but are more powerful and more heavily built. The sound of these horns cuts through practically any noise. Their sound is totally different from the metallic noises usually found in steel plants and for this reason they are particularly adaptable for signalling in noisy metal works. The Klaxocator is manufactured by the Klaxon Company, Industrial Division, New York City.

CALLING THROUGH THE SWITCHBOARD OPERATOR.

# ASSOCIATIONS AND SOCIETIES

REPORTS OF THE CURRENT PROCEEDINGS OF THE VARIOUS ORGANIZATIONS

## AMERICAN ELECTROPLATERS' SOCIETY

New York Branch of the A. E. S. meets every 2nd and 4th Fridays of each month at 32 Union Square, New York, N. Y.; Secretary, John Burke, 110 Glen St., Brooklyn, N. Y.

September meeting of the New York Branch of the A. E. S. was called to order by President Sterling, one application was received and referred to the Board of Trustees, Chairman Haas of the Laboratory Committee announced that the Laboratory was completely equipped, and that committee was ready to resume the usual Tuesday night Laboratory work for the Winter months. Royal F. Clark, Sect. of the Bridgeport Branch, delivered an interesting and instructive lecture; his subject was Electro Plating Graphophonic Master & Mother Record Plates.

October meetings were well attended. President Sterling presided. One new applicant was elected to active membership. Mr. Graham, a member of the New York Branch, gave a very interesting and instructive lecture on the construction of electroplating generators, Volt and Ammeters. Mr. Faint, ex-president of Newark Branch, extended an invitation to the members of New York Branch to attend an open meeting of the Newark Branch. Ex-President Hoddow, of New York Branch, spoke on the reliability of Roesleur's formulas. Other interesting topics discussed were chemically blackening rolled iron, brass plating trunk hardware, and the addition of benzonic acid to nickel solutions. The following members were appointed by President Sterling to act as a committee for the coming banquet of New York Branch: Messrs. Haddow, Voss, Haas, Flanagan, Mingers, Bopper, Burke, Schubert, Snyder and Stremal.

November meetings had the usual attendance. President Sterling presided. One application was received and referred to the Board of Trustees. It was decided an open meeting of New York Branch would be held some time after the banquet in February, 1920. Mr. Pflomn, a member of the New York Branch, read in paper in which he very clearly described the good and bad features of high and low grade Tripoli Composition. His paper brought out some very valuable points in which electroplaters are interested. Laboratory Chairman Mr. Haas delivered an instructive lecture on the Electro Chemical Reactions in plating solutions. Other subjects discussed were, the cause of black streaks in nickel solutions, replenishing old plating baths, and the addition of brightening agents to plating solutions.

Rec. Sec. STANLEY SCHUBERT.

## TOLEDO BRANCH A. E. S.

Toledo Branch meets every Tuesday at 7:30 p. m. in the Science Bldg., Toledo University, Corner Cherry and Page Sts. H. L. Myers, 410 Palmer St. Sec.

## THE ELECTRIC FURNACE ASSOCIATION

The Electric Furnace Association which met in Chicago at the Congress Hotel on Monday, September 22nd, 1919, brought together some of the foremost electric steel men of the United States and Canada. The purpose of the Association is to bring out the super quality of products made in the electric furnace, and an extremely interesting discussion of this subject took place.

The Electric Furnace Association is the outgrowth of a meeting held in New York last April which was attended by electric furnace men and at which time it was recognized that there was great need for closer co-operation between the electric furnace designer, the power engineer and those who operate electric furnaces. The Association is not an offshoot of any other society and its policy will be to co-operate with all other societies and associations who are interested in electric furnaces for the products of electric furnaces.

Among those who attended the meeting were L. E. Howard of the Simonds Manufacturing Co., L. M. Reed, Haynes Stellite Co., A. C. Jones of the Electric Steel Co., Chicago, W. F. Graham of the Spicer Manufacturing Corporation, E. S. Gardner, Illinois Steel Company, Edward T. Moore, Halcomb Steel Co., F. W. Chapman of the Standard Steel Castings Co., J. M. Blake, American Manganese Steel Co., A. Trevor Jones, American Steel Foundries, A. H. Miller, Midvale Steel & Ordnance Co., A. U. Tirbutt, Manitoba Steel Foundries, Ltd., Mr. Starr, Pettibone Mulliken Co., of Chicago and many others interested in the electric steel industry.

A permanent organization was effected and the following officers elected:

| | |
|---|---|
| President | — Acheson Smith |
| Vice-Presidents | — C. H. Booth |
| | W. E. Moore |
| Secretary | — C. G. Schluederberg |
| Treasurer | — F. J. Pyan |

The executive office of the association is Post Office Box 616, Niagara Falls, N. Y.

The next meeting of the Association will probably be held next Spring in conjunction with some of the national technical societies, and it is probable that a symposium on the subject of power for the electric furnace will be the principal feature of the meeting. This will give an opportunity for the power engineers and the electric steel men and other operating electric furnaces thoroughly to discuss the power service problem of the electric furnace.

Although the present meeting was largely devoted to electric steel, it is the intention of the Association to take up the subject of non-ferrous metals and other materials made in the electric furnace.

## NATIONAL ASSOCIATION OF BRASS MANUFACTURERS

A meeting was held at the Hotel Statler, Detroit, Mich., September 18th, 1919, and the next one was held in New York City at the Hotel Astor, Thursday and Friday, December 4th and 5th.

Mr. Mueller was appointed Councillor of the Association. Mr. Speakman, President, appointed a committee to represent the Association at the International Trades Conference which is to be held at Atlantic City, October 20.

The following resolution was passed:

The National Association of Brass Manufacturers, September 18, 1919, in convention assembled, hereby opposes Government ownership or operation of railroad and transportation and carrying companies and further requests that the railroads and carrying companies now under federal jurisdiction be returned to their corporate owners at the earliest date practicable, being governed in the unanimous passage of this resolution in the belief that by such action, all interest will be best served.

All information about the Association may be had upon application from Mr. Wm. M. Webster, Commissioner, Suite 1813-1818, City Hall Square Bldg., Chicago, Ill.

## NATIONAL RESEARCH COUNCIL

The Division of Industrial Research of the National Research Council is arranging for the formation of a co-operative association to plan and support fundamental researches in alloys. Although much valuable work has been done in this field by scattered investigators there is no doubt that a well-planned and co-ordinated effort by a co-operative association working under the general guidance of the National Research Council and composed of specialists representing both the manufacturers and the more extensive users of alloys can produce additional results of great importance. The success of other industries which have supported research on a co-operative plan, such as has been done by the National Canners' Association and the Malleable Iron Manufacturers, is evidence of this.

It is planned to create a special scientific staff composed of a

Director and Assistant Director of Research and a group of scientific investigators and technical experts who shall give their whole time to the work. To finance the organization each member of the co-operative association will pay $1000 a year, and all contributing members, who may be either alloy manufacturing or using individuals, firms or companies are to benefit alike by the results of the researches.

Office of the Executive Secretary, 1201 Sixteenth St., Washington, D. C.

## NATIONAL ASSOCIATION OF BRASS MANUFACTURERS

The National Association of Brass Manufacturers held their thirty-fourth annual meeting at the Hotel Astor on Thursday and Friday, December 4th and 5th. The work of elimination and reconstruction of the official catalog was started; the Convention was addressed by speakers from the United States Chamber of Commerce and by Mr. Wm. J. Wooley, the general manager of the National Trade Inspection Bureau. Election of officers took place, the matter of standardization was started and other matters of interest to the trade.

## NATIONAL VARNISH MANUFACTURERS

Mr. Carl J. Schumann, secretary of the Hilo Varnish Corporation, Brooklyn, N. Y., was elected President of the National Varnish Manufacturers' Association at the annual meeting in Chicago on October 28.

## THE NATIONAL SAFETY COUNCIL

In accordance with the action of the Annual Meeting of the National Safety Council on October 1, the Executive Committee of the Council has approved the organization of an engineering section.

This plan does not contemplate a "Safety Engineering" Section, nor does it attempt to define the term "Safety Engineer," which has been commonly applied to all men in responsible charge of safety work. The purpose of the new section is to bring together in closer contact the civil, mechanical, electrical, mining and chemical engineers in the Council's membership, so that they may contribute more effectively towards the solution of the purely engineering problems so frequently encountered in safety work—just as the physicians among the Council's membership are united in the Health Section.

Membership qualifications are parallel to those of the great national engineering societies, except that, for the present, associate membership (without the right to vote or hold office in the section) is open to engineers having three years' experience; this will gradually be increased to six years which is the requirement of those engineering societies having the highest standard of membership.

## THE INSTITUTE OF METALS

An important addition was made to the list of papers that were presented at the annual autumn meeting of the Institute of Metals in Sheffield on Wednesday and Thursday, September 24th, and 25th.

As originally published, the list included nine papers; there were ten, however, the latest communication being a note by an American metallurgical engineer, Dr. Zay Jeffries of Cleveland, Ohio, on "The Micro-Mechanism of the Ageing of Duralumin," a subject of great practical interest to all concerned with the working or use of an aluminium alloy that has played a vastly important part in aeronautical engineering during the war.

Dr. Jeffries went over to England in order to be able to present his communication in person to the Institute at its Sheffield meeting.

## NATIONAL INDUSTRIAL TRAFFIC LEAGUE

The National Industrial Traffic League held its summer meeting at the William Penn Hotel, Pittsburgh, Pa., Sept. 4th and 5th. Information can be obtained from O. F. Bell, secretary-treasurer, 413 Tacoma Building, 5 North La Salle St., Chicago, Ill.

# PERSONALS

### ITEMS OF INDIVIDUAL INTEREST

**C. F. Cyrex,** who recently returned from France, has joined the selling force of this company, and will travel from the Chicago office.

**H. Benziger,** of Jacksonville, Fla., is in New York, buying materials and machinery for the new plating plant of the Worthington Manufacturing Company, Jacksonville, Fla.

**Sergeant F. C. Rushton** has joined the selling force of A. P. Munning & Co. Sergeant Rushton will travel from the St. Louis office, located in the Chemical Building.

**F. C. Clement** has resigned as foreman of the repair and plating department of the Bellevue-Stratford Hotel, Philadelphia, Pa., to take the position of manager for C. Harlan Wessels, Philadelphia.

**H. E. Haring,** for the last two years in the inspection division of the Ordnance Department, is now connected with the Bureau of Standards, where he will be engaged in electrochemical research.

**C. L. Puffer,** for the past four years foreman plater with the Henry Likly Company, Rochester, N. Y., has resigned and accepted a similar position with the Glazier Manufacturing Company, of Rochester, N. Y.

**F. L. Griffin,** formerly with the M. S. Wright Company of Dorchester, Mass., has opened the National Plating Works, 106 Kossuth street, Bridgeport, Conn. Mr. Griffin has had wide experience in general electroplating.

**James F. Dieter,** superintendent of the Aluminum Castings Co., was tendered a farewell at a meeting of Unquowa Tribe, No. 60, Improved Order of Red Men. He has accepted the position of superintendent of the Garwood, N. J., plant of the company.

**Sigurd Frivik** has arrived in the United States to buy machinery for machining valves and equipment for making copper tanks. His company is a manufacturer of valves for steam and hot water service and is also engaged in the heating, ventilating and plumbing business. His temporary headquarters are at the Hotel McAlpin, New York.

**Royal F. Clark,** formerly general foreman of the Copper and Nickel Electroplating Division of the Matrix Manufacturing Department of the Columbia Graphophone Co., Bridgeport, Conn., has accepted a position with the Hammond Typewriter Company, New York City, as general foreman of the plating, buffing and polishing departments.

**William M. Corse** has resigned his position as technical superintendent of the Ohio Brass Company and accepted a position as general manager of the Monel Metal Products Corporation of Bayonne, N. J. Mr. Corse has had extensive experience in special alloy development work. The Monel Metal Products Corporation was formerly known as the Bayonne Casting Company. They manufacture all forms of Monel metal and aluminum bronze.

**Horace G. Cooke** announces his withdrawal from the Connersville Blower Company, which company he has repre-

sented in the East for twenty years, and announces the organization of the firm of Horace G. Cooke, Inc., to design and market for the National Marine Engine Works, Inc., a complete line of rotary compressors (blowers), gas exhausters and pumps. The executive and sales offices of the new company are at 50 East 42nd street, New York City.

---

**E. V. Peters,** general sales manager of the New Jersey Zinc Company, New York City, left October 10 for the West, to be gone a month on a business survey for that concern. He was accompanied by R. M. Neumann, manager of Western sales with headquarters in Chicago.

During their trip they investigated business conditions and at the same time inspected various distributing warehouses which the Zinc Company has established.

Messrs. Peters and Neumann visited, among other cities, Denver, San Francisco, Los Angeles, Portland, Ore., and Seattle.

---

**Mr. H. H. Harris** has been appointed manager for the department of heat-treating equipment of the Quigley Furnace Specialties Co., 26 Cortland Street, New York. Mr. Harris has devoted several years to the practical application of materials for heat-treating purposes, especially to steel mixtures and special alloys for carbonizing and annealing boxes, cyanide pots, etc. His experience in this work enables the giving of special advisory service to users of heat-treating equipment. He will be identified with an organization having headquarters in New York, with five branch offices, as well as representatives in thirty-five cities throughout the United States and Canada.

Mr. Harris was formerly General Sales Manager for the Swedish Crucible Steel Co.

**John H. Jerosky,** for the past five years departmental head of the core room, Mueller Co., Decatur, Ill., and Sarnia, Ont., Canada, has for the past three months been covering Quebec and the eastern cities of Canada, with headquarters in Montreal, representing the E. J. Woodison Co., foundry requisites, platers' and polishers' supplies.

Mr. Jerosky has been lately discharged from the U. S. Navy after two years' service and his past experience in the foundry business in the United States and Canada has enabled him to get in touch with different foundries, polishing and metal industries in Montreal and district.

He has now opened a branch house here carrying a full line of foundry requisites, polishing and plating supplies.

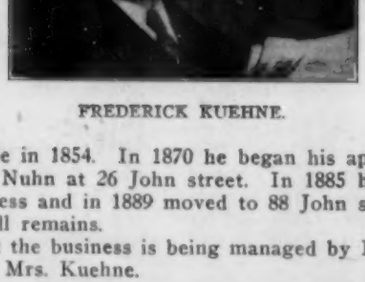
---

**Mr. Ernest V. Pannell** is now located in New York City as special sales engineer for the British Aluminum Company Ltd. Mr. Pannell has had considerable experience in the engineering and metal industry and is already well-known to many by his contributions to the technical press. He graduated from the Northampton Engineering College in London, England, in 1908 and after some years of construction and testing experience joined the staff of the British Aluminum Company in 1911. He has since been associated with the various production factories of the Company and also with the commercial side having been for the last four years manager of the Canadian Head Office in Toronto. Mr. Pannell is a member of the American Institute of Mining Engineers, The American Society for Testing Materials, the American Institute of Electrical Engineers and also an Associate Member of the British Institution of Electrical Engineers. He has made a specialized study of the use of aluminium for electrical purposes.

## DEATHS

### FREDERICK KUEHNE

One of the pioneers of electro-plating was lost when Frederick Kuehne died in September, 1919. For thirty years he had carried on a silver-plating and repair shop at 88 John street, which was known all over New York. He was born in



FREDERICK KUEHNE.

Poughkeepsie in 1854. In 1870 he began his apprenticeship under John Nuhn at 26 John street. In 1885 he succeeded to the business and in 1889 moved to 88 John street, where the shop still remains.

At present the business is being managed by Miss E. Lily Kuehne and Mrs. Kuehne.

### FREDERICK C. OHLMACHER

Frederick C. Ohlmacher, 51 years old, an electro-chemist and head of the Lockport Chemical Works, died, following an operation for appendicitis. Although his condition was favorable for a time, a change occurred which left little hope for recovery. He was removed to the hospital where he died.

Mr. Ohlmacher had been a resident of Lockport for the last twenty-four years. Five years ago he opened the Lockport Chemical Works where he undertook various enterprises in the electro-chemical field, including the metallizing of flowers; and developing the manufacture of cleaning and plating compounds. Prior to that he held the position of

FREDERICK C OHLMACHER.

traveling salesman for the Bennett-O'Connell company of Chicago.

Besides his widow he is survived by three daughters, Miss Vera, Miss Florence and Miss Ethel Ohlmacher, his parents, Mr. and Mrs. C. J. Ohlmacher of Sycamore, two brothers, Dr. J. C. Ohlmacher of Vermillion, S. D., and Winfield S. of Ottawa, two sisters, Miss Gertrude A. of Havre, Mont., and Mrs. Arthur Ludwig of Sycamore. Mr. Ohlmacher was a member of the Lockport Lodge, No. 538, A. F. & A. M.

## JOHN F. P. LAWTON

John F. P. Lawton, secretary of the Gorham Manufacturing Company since its incorporation in 1865 in Attleboro, Mass. Mr. Lawton had been in poor health for about five years.

He had been connected with the Gorham Company in various capacities for more than 60 years, having entered its employ in August, 1859. In addition to his duties as secretary, Mr. Lawton had been, since January, 1894, assistant treasurer of the corporation.

In addition to his positions at the Gorham Company he was secretary, assistant treasurer and a director of the Silversmiths Company. He was among the founders and the first secretary of the Rhode Island Congregational Club and a member of the Central Congregational Church.

He was born in Philadelphia, Sept. 26, 1837, the son of the late Joseph and Grace Lawton. Coming to Pawtucket with his parents in 1842, he entered the Grove street school. In 1858 he came to Providence as bookkeeper in George H. Whitney's bookstore at 1 Westminster street.

Here Mr. Lawton met the principal lawyers, literary men and others prominent in Rhode Island, among them President Francis Wayland of Brown University, Profs. Angell, Harkness, Lincoln and Diman.

In 1859 he entered the employ of Gorham & Co., whose offices were on Steeple street. Six years later, when the concern was incorporated and its name changed to Gorham Manufacturing Company, Mr. Lawton was chosen secretary. He was made assistant treasurer 25 years ago.

## GEORGE C. EDWARDS

George C. Edwards, vice-president of the International Silver Company in Bridgeport, Conn., and founder of the Bridgeport Chain Company, died at his home, 174 Park Place, Tuesday, September 23, after an illness of over a year's duration. Mr. Edwards underwent an operation in May, 1918, and since that time has been in an enfeebled condition. The operation was said to have hastened his death.

Mr. Edwards was born in Watertown, Conn., in 1846, and attended the schools of that city, graduating from the Watertown Academy, in his early twenties he became interested in the chemical manufacturing business in Waterbury and was for some time located there.

Leaving Waterbury, he went to Binghampton, N. Y., where he became one of the pioneers in the manufacture of wood alcohol in this country and built up a profitable business. This business he later sold out and went to New York City, where he became interested in the manufacture of nickel silver alloys with his brother-in-law, Charles Holmes.

Later Mr. Edwards and his brother-in-law bought the Rogers and Britten Company in Bridgeport and founded the Holmes and Edwards Company in 1881. The company continued under this name until the formation of the International Silver Company in 1898, Mr. Edwards being since that time its first vice-president.

About 25 years ago Mr. Edwards founded the Bridgeport Chain Company and was president of this concern at the time of his death. He was also interested in light and power companies in Minnesota some of which he founded.

Mr. Edwards was a director in the City National Bank and a trustee in the Bridgeport Savings Bank. He was for many years a member of the Trinity Episcopal Church, where he was vestryman and warden.

## ALBERT F. BROOKER

Major Albert F. Brooker, former superintendent of the Coe Brass plant, died December 9, at his home in Torrington, after illness of over a year. Major Brooker was 82 years of age, a native and lifelong resident of Torrington. He was a cousin of Charles F. Brooker, of Ansonia, president of the American Brass Company, and a brother of Mrs. John A. Doughty. Major Brooker served throughout the Civil War, participating in many important engagements. At the siege of Petersburg he was in charge of several batteries of the heaviest guns used in the war. One of these guns, the Petersburg Express, now stands in front of the capitol building in Hartford. Among Major Brooker's effects were several highly commendatory letters and telegrams which he received from prominent leaders in the Civil War. One of these is a telegram from General McClellan complimenting him upon the manner in which his command had destroyed a nest of houses in which were concealed snipers who were playing havoc with the Federal troops. It was after the close of the war that Major Brooker entered the employ of the Coe Brass Manufacturing Company, which is now a subsidiary of the American Brass Company. He was for nine years superintendent of the plant and retired at the end of that period to devote his attention to his large realty holdings. He owned a great tract of land in what is now the southwest part of the borough of Torrington, that land having formerly comprised the farm of his grandfather, who was one of the pioneer residents of Torrington. Major Brooker was a member of the Army & Navy Club, the Masons and the G. A. R. Post. He leaves besides his sister, Mrs. Doughty, a daughter, Mrs. A. C. Thompson. His funeral was held Thursday, December 11, with burial in Center Cemetery, Torrington.

# TRADE NEWS

### BUSINESS REPORTS OF THE METAL INDUSTRY CORRESPONDENTS

## NEW BRITAIN, CONN.

DECEMBER 8, 1919.

At a meeting of the directors of the Landers, Frary & Clark company, held December 8, it was voted to recommend to the stockholders an increase of from five to six million in the capital stock, also to issue a dividend of 2 per cent and an extra dividend of 2 per cent. This is but a minor reflection of the business being done by this one concern and, going further, it reflects to some extent the boom that the metal manufacturing industry is experiencing in this city. And all without the least outward sign of any labor troubles.

Expansion has been the watchword during the past year at every local plant. From April 1 to the present time, approximately $700,000 worth of new factory buildings (including additions) have been built, and the following figures give some idea of how the factories have grown: American Hardware corporation, $272,000; Landers, Frary & Clark, $130,600; Hart & Hutchinson, $100,000; Fafnir Bearing Company, $49,000; Stanley Rule & Level Company, $42,000; Stanley Works, $38,000; Taplin Manufacturing Co., $18,000; North & Judd Manufacturing Company, $11,000.

The illumination of the factories here at night tells of over time operations. At Landers, Frary & Clark and some branches of the American Hardware corporation the hum of the wheels is heard until 9 p. m. New Britain manufacturers are meeting the domestic demands at present, but the extensive foreign trade will not be forgotten. The Stanley Works have a plant in Hamilton, Ontario, and another in Japan, while it has recently opened a branch office in France. North & Judd have established an office in Australia to develop trade with the Antipodes. Landers, Frary & Clark have long been cultivating a South American trade.

To insure better working and living conditions, and to make for a better and more contented class of employees, the local concerns have given the financial support to hundreds of homes that are in the building. This loaning corporation, organized and backed by the factories, provides funds that are loaned to workers. More than 200 new homes will be built this year, and more than one million dollars in second mortgages at 5 per cent will be loaned.

A review of the year, especially that part of it since demobilization of the army, shows that every concern that sent a soldier or sailor into service made sure that this man had a place of employment on his return. In consequence of increased business immediately following the war, the industrial army, mobilized in New Britain, has been materially augmented, and a conservative estimate is that there are now fully 3,000 more workmen employed here than there were during the greatest rush periods of the war.

In New Britain the open shop is the absolute rule and there is no exception. There are trade unions here among the metal manufacturing workers, but they are not sufficiently strong to cause any annoyance, and industry here has always seen to it that organized labor does not get a firm foothold. While employees, members of unions, are not shunted to one side, but are given an equal opportunity with the others, no trade union is permitted to dictate to the factories. This must not be construed to mean that the factory officials are an overbearing, autocratic lot. Quite the contrary, and it is to their credit that without organization to support their demands, the New Britain laboring man is a well cared for and as contented an individual as can be found. H. R. J.

## TORRINGTON, CONN.

DECEMBER 8.

There has been phenomenal development along industrial lines in Torrington during the past several months. Contracts have been awarded for two immense new factory buildings, several other additions are under consideration, a half-million-dollar homes corporation has been formed by local manufacturers to aid in solving the housing problem here, and a new industry has located in town.

The two big factory additions, both of which are now under construction, are at the Standard plant of the Torrington Company and at the plant of the Torrington Manufacturing Company.

The Standard addition is to be of brick construction, two stories high, 340 feet long and 50 feet wide, and will adjoin the present factory. The contract, it is said, involves close to $80,000. The Torrington Building Company is doing the work. It was only recently that another big addition was built at the Standard plant.

The addition for the Torrington Manufacturing Company is to be 60 x 180 feet, two stories high of concrete construction, and will cost approximately $100,000. It is to be on the Treat street side of the present plant, and will extend over the town line into Harwinton. The Aberthaw Construction Company of Boston has the contract.

The corporation formed to solve the housing problem is the Torrington Homes Corporation, capitalized at $500,000. The incorporators were James A. Doughty, C. H. Alvord and James H. Graham, all three of whom are prominent in manufacturing circles here. The company not only plans to assist workers in building their homes, but contemplates the erection of a new hotel here. At a meeting held recently, James H. Graham, of the Torrington company, was elected president; Frederick L. Braman, of the Coe Brass Branch of the American Brass Company, first vice-president; Charles H. Alvord, of the Hendey Machine Company, second vice-president; F. J. Damon, of the Union Hardware Company, third vice-president; Frank A. Appelt, of the Warrenton Woolen Company, secretary, and F. H. Griffiths, of the Turner & Seymour Manufacturing Company, treasurer.

The new industry which has located here is a branch of the Warner Corset Company. This concern has leased the old needle shop on Railroad square, and will use it in manufacturing cardboard boxes for corsets. About 40 persons, mostly women, are to be employed there at first, and this number will be gradually increased.

Besides the factory additions already mentioned, it is understood that several other large additions have been planned by at least three of the leading concerns in Torrington, and that contracts will be awarded shortly. Never before has the industrial outlook been so promising in Torrington as it is today.

The labor situation here appears on the whole to be satisfactory. Wages are higher than ever before, and the workers are prosperous and contented. A co-operative grocery is being organized in an effort to help the workers meet the tremendous increase in the cost of living. The grocery is to be capitalized at $150,000, divided into 3,000 shares of $50 each.

During the latter part of November many thousands of leaflets from the "Communist Party of America, 1219 Blue Island avenue, Chicago," urging the workers to rise against the capitalists and set up a soviet system, protesting against the blockade of the Allies against bolshevist Russia and denouncing martial law at Gary, Ind., were distributed broadcast through the streets of Torrington. The police were of the opinion that the pamphlets were tossed from an automobile. A few nights later a similar distribution was reported in Naugatuck.

An important undertaking authorized within the past few weeks was the construction of a trade school building in Torrington at a cost of $40,000. The expenditure was approved by the voters of the town. The cost of equipping and operating the school will be borne by the State. The building will stand on South Main street, and will be of brick construction. On the first floor will be the carpentry, patternmaking and printing departments; on the second floor, the machine department; and on the third and top floor, the drafting and electrical departments. The building will be 42 x 120 feet. The trade school plan has been tried here in an experimental way, and has been found highly successful. Not only do the pupils learn a trade, but while learning it they are able to do considerable piece work for the various factories. When the question of expending $40,000 for a building was brought before the voters there was not a word of opposition, and the appropriation was unanimously approved.

A successful drive for a $250,000 Y. M. C. A. building in Torrington was conducted between December 8 and 11. Over 200 workers took part in the drive with Harry J. Wylie, of the Hotchkiss Brothers Company, as field marshal, and William E. Besse, of the Coe Brass Branch, and F. H. Griffiths, of the Turner & Seymour Manufacturing Company, as generals. A few of the largest contributors to the fund were: Charles F. Brooker, of Ansonia, $10,000; U. T. Hungerford, of New York, $5,000; Mrs. A. E. Godfrey, of Litchfield, $5,000; Miss Ella Coe, of Litchfield, $5,000; L. G. Turner, $1,200; Mr. and Mrs. George H. Braman, $750; Mrs. L. A. Coe, of New Haven, $1,000; James A. Doughty, $5,000; W. W. Mertz, $1,000; Frederick L. Braman, $1,000; William E. Besse, $750; William E. Hunt, $750; Thomas W. Bryant, $10,000; manufacturers of Torrington, $50,000; Wadsworth Doster, $500; Frank J. Damon, $1,250; James E. Mallette, $1,400; John M. Wadhams, $725.

Treasurer John P. Elton, of the American Brass Company, has sent from his office in Waterbury to stockholders of the company announcement that, in view of the prompt publicity given to the declarations of dividends by the directors, the company will discontinue the practice of mailing to stockholders formal notices of such declarations.

The Trumbull-Vanderpoel Electric Company of Bantam recently purchased a group insurance policy for its employees, office help and officers included. Each policy is for the amount of $500, and will be increased $100 each year until the maximum of $1,000 is reached.

An addition, 60 x 30 feet, is being built to the plant of the Plume & Atwood Company in Thomaston. The addition is to be used for the saw room and plater's department.

James A. Doughty has been re-elected president of the Charlotte Hungerford Hospital. Robert C. Swayze is vice-president, John M. Wadhams, treasurer, and W. A. Roraback, secretary. Over 800 patients were admitted to the institution during the past year.

A son was born October 29 to Mr. and Mrs. Frederick L. Braman, of Torrington. Mr. Braman is a vice-president of the American Brass Company.

William F. Dautrich has given up his position as manager of the engine sales department of the Standard Plant, Torrington company, to become general manager of the Borgeson Manufacturing Company, Torrington. He was with the Standard plant 12 years.

Mr. and Mrs. Clive B. Vincent will sail soon for England. After visiting the English branch of the Torrington Company at Coventry, Mr. Vincent, who is treasurer of the Torrington Company, will go to Aachen, Germany, in connection with efforts to recover the company's property there. The Aachen factory

was operated in the production of needles during the war, and so far as can be learned has been taken over by another company in order to prevent its being seized by the German government. Its exact status is not known. Before the war the factory employed about 300 hands, and was valued at about $200,000.

E. H. Hotchkiss, of the Hotchkiss Brothers Company, and Charles H. Alvord, of the Hendey Machine Company, have offered silver cups to winners in the factory bowling league series.

G. Q. Porter, general manager of the National Sweeper Division of the Torrington Company, has been elected president of the Greenwoods Country Club.

All but one of the State Guard units organized in Torrington during the war have been discharged from service. Major William E. Besse, superintendent of the Coe Brass Branch of the American Brass Company, was prominently identified with the formation of these units, and was in command of the battalion during the period of the war.

William B. Phillips, for 34 years employed as a caster at the Coe Brass Branch of the American Brass Company, died suddenly of heart failure October 9 at the plant of the Fitzgerald Manufacturing, two or three hours after he had taken a job in the shipping room of the latter plant. He was 64 years old.

Captain H. C. Billings was in Torrington recently in connection with the movement for reinstatement of ex-service men in their former positions. Most of the Torrington manufacturers have made a practice of taking back all ex-service men so far as possible.

In the Torrington Company's inter-plant baseball series the Standard plant's team won the silver cup offered by Superintendents John A. Calder and Harmon J. Cook. The Excelsior Needle team finished second and the Progressive team third.

According to figures compiled by F. J. Deakin, registrar of voters, out of 274 aliens employed in the plants of a local company, 177 have expressed their desire to become American citizens and 97 have stated that they do not wish citizenship.

Torrington plants, it is stated, have enough coal on hand to continue operating for over a month. Much of the electrical current used here comes from the big plant at Falls Village, which is operated by water power.

## PROVIDENCE

DECEMBER 8, 1919.

The Pace Sharpener Corporation of this city, capitalized at $100,000, to manufacture sharpening tools of various descriptions, has received a charter from Secretary of State Parker under the laws of Rhode Island. The incorporators are William F. Almy of Cranston, D. Bradbury Perkins of Providence and Arnold C. Messler, of Pawtucket.

The Spartan Needle Company, to be located in Providence, with a capital stock of $200,000, to acquire inventions and patent rights in knitting machinery and kindred lines, has been granted a charter by Secretary of State Parker under the laws of Rhode Island. The incorporators are J. Franklin Wilcomb of Worcester and William P. Wood and Arthur M. Allen of Providence.

The contract has been awarded for remodelling of the plant on Newell avenue, Pawtucket, of the Woodlawn Machine Screw Company, which was recently purchased, by Lang & Hoffman of Fourth avenue, New York. The work also includes a one-story brick addition, 80 by 90 feet to the present building.

The Atlas Sheet Metal Works, 237 Dyer street, have the contract for the sheet metal work on the large extension to the Capitol Hill garage on Orms street. There are to be three monitor skylights and a 50-foot elevator skylight.

A two-story plant is being erected on Webster street, Cranston, for the Mueller Metal Company, of 288 Dyer street, Providence. It is to be of brick and concrete, 50 by 100 feet and cost $13,000.

A new foundry building, 60 by 80 feet of brick, mill construction for the Franklin Machine Company, 189 Charles street, is under way.

The manufacturing property, including land and building, at 48 and 56 Bagley street, Pawtucket, and occupied by the H. M. H. Company, manufacturing jewelers, has been purchased by that concern.

At the plant of the Standard Nut and Bolt Company, Valley Falls, a full time schedule is being maintained, and the orders for the firm's production are accumulating.

According to a statement issued during the past month by Joseph G. Doran, secretary of the Woodlawn Machine Screw Company, 136 Newell avenue, Pawtucket, the firm has voted to dissolve the partnership, the reason being that Government contracts upon which the concern worked for the past two years have been completed. The factory was a branch plant of James C. Doran & Sons of Providence and employed an average of 200 hands. The firm was established in 1915 for the manufacture of screw machine products and specialized in fuse parts. The mechanical equipment has been sold, including a variety of milling machines, automatic screw machines, bench milling and slotting machines, electric and gas hardening and annealing furnaces, testing equipment and numerous other machines.

The Comstock-Wood Company of this city, with a capital of $5,000, to deal in precious stones and jewelry, has been granted a charter under the laws of Rhode Island. The incorporators are Walter D. Wood and Walter C. Wood of Cranston and Benjamin W. Comstock of this city.

Free certificates of life insurance have been presented by the L. J. Anshen Company, manufacturing jewelers, 144 Pine street, to its employees. Policy amounts are based on length of service, continuous service, ranging from $500 for less than one year, up to $1,000 for five or more years. The insurance "does not in any way take the place of any payments to be made for accidents under the Workmen's Compensation laws." The policies have been purchased by the firm under a group insurance plan.

George F. Berkander, manufacturing jeweler, at 43 Sabin street, is about to erect a new factory building for jewelry purposes upon land recently purchased by him at the corner of Lexington avenue and Broad street. The new factory will be two stories high and will be built of concrete and steel, being as nearly fireproof as it is possible to make it. The main building will be 50 by 204 feet, with three ells, one 33 by 47 feet, another 24 by 33 feet and the third 11 by 22 feet.

The C. G. Brunnchow Company, 227 Globe street, has increased its capital stock to $50,000. The firm was first chartered in 1904 with a capital stock of $10,000, which was increased to $30,000 in 1915.

The Screw Machine Products Corporation has increased its capital stock from $100,000 to $150,000 and enlarged its scope of business powers under its charter, according to a certificate that has been filed at the office of the Secretary of State.

W. H. M.

## DETROIT

DECEMBER 8, 1919.

The metal industry in Detroit, like all other lines, has experienced unprecedented prosperity during the year that is drawing to a close. Demands from both home and foreign markets have been more than could be met. And as the year goes out the brass, copper and aluminum industry still is face to face with the greatest period of prosperity in the history of Detroit and its suburbs. Even though extensions have been great, there seems to be no end to the demands that are made on the plants for increased production. The automobile industry, of course, is largely responsible for this condition. Never were the plants so busy as they are at the present time. More automobiles will be manufactured in Detroit in 1920 than ever before.

Detroit, at the same time, has been blessed during the year by having no serious labor upheavals. Although this city is reported by authorities as one of the centers of labor radicals, manufacturers here have had a serene year. The strong hand of the Detroit Police Commissioner and good wages are believed responsible for the present conditions. Some of the most notorious radicals of the country are said to have attempted to get a hearing in the great industrial plants here, but in practically every instance they have been easily suppressed.

But there is a grave danger that faces every manufacturer in Detroit at the present time, although it is from without rather than from within. It is the coal situation. It has hung like a menacing cloud over this section for many a day. When it became certain that a general coal strike was sure to occur, manufacturers, as a rule, began to stock up, but it was impossible to accumulate a surplus of coal sufficient to last any great length of time. Then came authoritative regulations more stringent that those during the great war. Consequently Detroit plants are closing down or operating on a three-day basis. Everyone is hoping for the best, and it may be that before this letter appears in print the strike will have been settled. But even at that the industries here have received a shock that will take them weeks to overcome. It is no easy matter for a great industrial institution to speed up quickly after it has once slowed down. It may take three or four weeks before normal conditions are reached, and that means a great deal when production is regulated by hours and minutes. Even if the coal strike should be called off today, the results would be felt just the same all through the year. However, everyone is hoping for brighter days soon, and is doing his best to meet the situation bravely and successfully.

At a meeting of directors of the Edmunds & Jones Corporation here recently it was voted to use a surplus of $1,100,000 on plant extensions. It also is announced that the annual report as of October 31, 1919, showed profits of $438,000. The regular quarterly dividend of 50 cents a share on the common and 1¾ per cent. on the preferred stock is announced to be paid January 1. This corporation is one of the largest manufacturers of automobile lamps in the country.

The Michigan Steel & Metal Company have made arrangements with the Aeronautical Equipment, Inc., to assist in disposing of, in Michigan and Ohio, the seven million pounds of free cutting round brass rod which the Aeronautical Equipment, Inc., purchased from the Government and are now offering direct to consumers.

The Moak Machine & Tool Co. of Port Huron opened its new grey iron casting foundry November 1. Formal announcement was made by means of engraved cards. This company has unusually favorable prospects.

## PHILADELPHIA

DECEMBER 8, 1919.

The closing weeks of the year 1919 find the non-ferrous metal industries of Philadelphia in a flourishing condition, with bright prospects of very good business during the early part of 1920. Unless the coal situation should become acute and conditions demand that the fuel administration conserve coal by curtailing many industries, there is no reason why the metal trades of this district should not prosper for a long period.

At the present writing these industries are in better position than the iron foundries and allied trades, which are suffering from the shortage of pig iron resulting from both the recent steel plant strike and the present fuel scarcity. Both the iron and the non-ferrous industries are facing a bright future as far as the demand and volume of inquiries for new business would indicate, but at present the non-ferrous are in better shape to handle the new business.

Practically all the brass foundries and shops engaged in specialty work, hardware manufacture, valves and fittings, lighting fixtures and chandelier making are exceptionally busy, and some of them are adding new equipment to their plants. Builders of certain lines of machinery are very busy, particularly those making textile machinery, which is in great demand for enlargement of the various cotton and wool mills and factories which in recent months have been compelled to grant shorter work days to their employees, and in consequence are obliged to add new machinery to bring production up to former volume.

Many of these foundries are employing more men than they did during the war rush of more than a year ago. This condition has not existed continuously since the armistice, but has been a gradual growth up to the present capacity operation. The early months of this year were very lean business months, with extensive lay-offs of workers and general readjustment of production from war orders to the standard peace output of the various plants. New orders in many cases did not come freely and the slack condition lasted for half the year or more. During the late spring and early summer months inquiries for work began to come in heavier volume, and the after-war lull showed signs of vanishing. Since that time the amount of work has steadily increased. The developments of the second half of the year have fully justified the predictions of well-informed men in the trade made in these letters six months ago to the effect that the dull market would not last long and that a new buying wave was likely to come with an upward trend of prices.

Many of the metal industries of Philadelphia, on the other hand, have been fairly busy all during the year, without experiencing any serious dullness after the stoppage of war activities. Among these are the builders of locomotives, large machinery and the shipyards particularly, which have kept on working full force with the exception of cutting out the overtime work so general during the war. New ships have continued to slide into the Delaware almost with clock-like regularity, several each week all this year.

The general labor situation has been very satisfactory. In the early months of the year the shipyards and the busier plants were able to absorb all the workers who had been laid off in the large munition, rifle and gun factories. In some lines skilled labor has been scarce all the year but, generally speaking, there has not been any serious labor disturbance in any of the metal industries of the city. Wage scales are perhaps higher on the average than they were during the war, but the readjustment has come about peacefully. This city has probably been more free from strikes than any other large industrial center in the entire country. Unemployment is practically an unknown condition.

A new four-story reinforced concrete building, 100 by 300 feet, is to be built by the Edward G. Budd Manufacturing Co., makers of steel automobile bodies and tops. The new addition and its equipment is to cost $500,000.

The Newton Machine Tool Works, Inc., is adding to its plant new buildings to cover a plot 230 by 400 feet, which will include erection shop, pattern and storage shop, forge shop and power plant. Two 50-foot span electric traveling cranes will be erected.

The Southwark Foundry & Machine Company, of South Philadelphia, has acquired the entire plant of the Quincy Engine Co., Chambersburg, Pa., which will be used for machine production, giving employment to about 200 men.

## CLEVELAND

DECEMBER 8, 1919.

Just as the steel strike seems about over, as far as resumption of production is concerned, comes now a blow that will, if not forestalled, knock the bottom out from under all industry. This is the coal situation growing out of the coal strike. Miners in Ohio, to date, have failed to return to work, awaiting a decision on wages and hours from Washington. There are about 40,000 miners involved in this state. At the moment it looks as though a return to heatless days, as during the war two winters ago, is imminent. A coal embargo has been put into effect against industrial users, following a meeting of fuel authorities as represented in the Cleveland federal fuel committee. This edict is that only public utilities, hospitals, homes and industries engaged in the manufacture or preservation of food products may be supplied with coal. It is the opinion among officials of the Cleveland Chamber of Commerce Industrial Committee that many interests will have to close if this order continues in effect. About the only factories not likely to be affected will be those receiving power from outside, which is, in most instances, from public service corporations. Even electrical power is likely to be curtailed later by order from Washington, federal officials here admit. Even though there is a marked resumption of steel production, the best estimates at this time place production only at 50 per cent of normal. It will mean little to members of the metal industry, as each establishment is dependent more or less upon others for raw materials or outlet for finished or semi-finished products. With no manufacturing going on, leaders in the industry here admit that business will be curtailed seriously.

Metal working establishments, particularly those identified with the automobile industry, have been planning ahead for tremendous activity, based largely upon the assertions of motor car producers in this and Michigan territory that they propose

to double their original output of 1920 cars. Many new plants have been erected or are in prospect. Much new machinery and similar equipment has been purchased by members of the industry. Business is coming into this market from Canadian interests which are progressing rapidly. All this business must be lost if there is no fuel with which to continue production.

Some indication of what the immediate future holds out for the industry, if anything like normal conditions can obtain, is seen in the announcement of various organizations for extensive operations here. For example, the Marsh Motor Car Company, recently reorganized from the Sterling Motor Car Company, and incorporated for $3,000,000, is planning to come to Cleveland, where it will erect one of the largest plants in the city. The company proposes to make a car to sell around $1,000, and plans to employ 2,000 men at the outset. More than 100 acres of land have been purchased in the East End manufacturing district, according to W. T. Marsh, president of the company. A building to cost about $250,000 will be erected upon this tract. The company proposes to turn out 5,000 cars the first year. Cleveland was picked because of its central location, Mr. Marsh said. The International Steel Tube Company, capitalized at $2,500,000, is preparing to establish the first unit in a mammoth factory here for the production of seamless tubes. Eventually this is expected to be the largest tube factory in the Pennsylvania-Ohio manufacturing district. The company has acquired a 22-acre parcel. Officers of the company include William P. Day, as president, and who also is president of the International Steel Tie Company; Thomas Parrock, formerly of the Republic Steel Company, vice-president; John B. Hull, vice-president; C. H. Hopkins, treasurer.

Plans for the establishment of one of the largest automobile parts plants in the country will be announced at an early date by the Fisher Body Ohio Company, according to Fred W. Fisher, president. Other officers recently elected include: Charles F. Fisher, vice-president; A. Mendelsohn, secretary; L. Mendelsohn, treasurer. Directors also will be named at an early date. The company lately was incorporated for $10,000,000. It will make automobile bodies for numerous motor car plants in the Middle West territory.

In spite of the contention of large manufacturing interests here that there is little hope for immediate resumption of export business with foreign countries involved in the world war, the foreign trade committee of the Cleveland Chamber of Commerce has started activities toward increasing that branch of business. Ambitions now are to form an export managers club in Cleveland, based somewhat upon the plan of the New York Export Managers Association, or the Boston Round Table. The arguments that will be advanced are that the new Welland canal will be completed in about three years, and that direct-to-Europe shipments can be made from Cleveland. It is likewise pointed out that certain types of ocean vessels can already come into Cleveland. Local manufacturers, however, look for little business from Europe. Representatives of large interests are writing home to Cleveland telling of the desire of business in France and Belgium to deal with Germany, in spite of the differences between those nations. These representatives state the rate of exchange, making the American dollar high, and the German mark low, is working to the advantage of German interests.

The Zahner Metal Sash and Door Company, Canton, has been awarded a verdict of $60,000 damages against the Pennsylvania Railroad Company, following a suit that arose over a fire that destroyed the plant about two years ago. The Zahner company alleged that sparks from a locomotive set fire to the building and that another locomotive cut the hose.

## COLUMBUS, OHIO.

DECEMBER 8, 1919.

The metal business during the past year was fairly active for a greater part of the time, although there were many developments which caused uncertainty in the trade. Buying for the greater part of the year was for immediate needs only, and it was only towards the close that there was much movement to buy for the future in the hope of accumulating some reserve stocks. But for the most part, orders provided for immediate shipment and were intended for the immediate present.

Labor conditions in Columbus and central Ohio territory were generally satisfactory. In fact Columbus has been particularly free from strikes and lockouts, and as a result metal-using concerns were in operation during the year. There was a short strike in the electrical department of the Citizens Telephone Company, and also among the linemen of the Columbus Railway, Power and Light Company, but this did not affect the metal trades to any extent. The coal strike at the latter part of the year had a slight effect on the trade, but not to any great extent.

Prices during the year were somewhat unsteady, although there was an appreciable strengthening towards the close. But for the most part prices followed the basis quotations in the New York metal market. Some local conditions caused a variation from time to time, but this was slight. On the whole the year was a fairly active one in the metal trades and a considerable business was done by local jobbers. Several new metal-using concerns were put in operation in the city and others enlarged their facilities which caused a larger consumption of metals.—J. W. L.

## TRENTON, N. J.

DECEMBER 8, 1919.

The strike of the soft coal miners for a time threatened a shutdown of the metal industry plants of Trenton because of the scarcity of bituminous fuel. The John A. Roebling's Sons Company, one of the largest concerns of its kind in the world, was compelled to close for a few days, throwing about 6,000 hands out of employment. Because of the scarcity of room at the Trenton plant the company has to store its coal at the works at Roebling, N. J. In order to start operations again the concern was compelled to haul coal up the Delaware river on barges and distribute it to the various Trenton plants on auto trucks. The Trenton city commissioners erected a large derrick at the Municipal dock for the use of the Roebling company when freight cars were denied the use for carting the fuel.

The Ingersoll-Trenton Watch Company has awarded a contract to the Aljon Construction Company, Inc., of New York, for the erection of an addition to the plant on Monmouth street, to cost $2,000.

The employes, as well as the owners of the Trenton metal plants, are very much in favor of the daylight saving plan. Although this plan was defeated by Congress several of the states have taken up the matter and will allow the people to use their own judgment. At a recent vote contest conducted in Trenton by the Chamber of Commerce, more than 800 employes of the Jordan L. Mott Company cast votes in favor of the proposition. The result of the vote will be sent to the New Jersey Senators and Congressmen at Washington. The John A. Roebling's Sons Company has contributed $500 to the Roosevelt Memorial Fund. Other metal concerns have given smaller sums, as well as their employes.

Nicholas Loukopulos, of Trenton, has sailed for Patras, Greece, where he will represent the Newark Metal Bed Company, of Newark, N. J. He will remain in Greece for some time and will establish branches in various parts of that country for the metal concern. He sailed from New York on the steamship *President Wilson* and had shipped with him a number of sample metal beds.

The New Jersey Court of Errors has affirmed the decree advised by Vice Chancellor Griffin, dismissing a bill filed by Albert C. Wall, substituted administrator of F. Augustus Heinze, against the American Smelting and Refining Company. The suit was brought by Mr. Wall, as ancillary administrator, to obtain possession of certain stocks and bonds pledged by the late Mr. Heinze as collateral with the American Smelting and Refining Company.

Sustaining an order of the New Jersey Public Utility Commission allowing the Public Service Electric Company authority to increase rates for electrical energy for mechanical power purposes, Justice Bergen, in the New Jersey Supreme Court, holds that "private contracts as to rate to be charged for furnishing power must yield to the public welfare, and the state may fix a just and reasonable rate without regard to that reserved in the contract." The suit decided by this opinion was started by the Independent Lamp and Wire Company, Bound Brook Oilless Bearing Company, Edison Storage Battery and other concerns. These companies had contracts with the Public Service

Company to supply them with electricity for commercial purposes at rates stated in the contracts.

The plant of the Clark Brothers' Lamp and Brass Company, situated in East Trenton, has been sold to M. R. Isaacs, of Philadelphia, vice-president of the Union Casein Company and the National Waste Company. The price paid for the plant was $45,000. The lamp works has been idle for many years.

It is rumored that the Mohawk Metal Toy Company, of 43 Bleecker street, New York, will remove their plant to Newark, N. J. The concern manufactures metal toys of various description and employs more than 100 people. The National Metal Stamping and Manufacturing Company, of Newark, N. J., has sold its plant at Mulberry and Murray streets, to the National Sponge and Chamois Company. The buildings cover a plot 200 x 400 feet.

The Essex Metal Company, Inc., of 22 Orange street, Newark, has been incorporated, with $100,000 capital, to engage in the manufacturing business.

The Hightstown Hardware Company has been incorporated to deal in all kinds of tools and hardware and other commodities. The company has an office at 118 South Main street, Hightstown, N. J., and the incorporators are J. Albert Priory, Elmer B. Chamberlain and Egbert C. Steinsieck.

White Metal Manufacturing Company, of Jersey City, N. J., has been incorporated at Trenton, with $500,000 capital, to manufacture and deal in containers. The incorporators are Theodore Rurode, T. H. Smith and D. F. Edwards, all of Jersey City.

Gordon Pen Company, of West New York, N. J., has been incorporated at Trenton, with $50,000 capital, to manufacture and deal in fountain pens, etc. The incorporators are R. J. Heitzman, of Union Hill, and William Gordon and Julius Abegg, of West Hoboken, N. J.

The plant of the International Arms & Fuze Company, situated at Bloomfield, N. J., has been sold to the General Motors Corporation, of New York. The new owners will use the works for the manufacture of automobile parts.

The F. & H. Foundry Company, Inc., of Newark, N. J., has been incorporated at Trenton, to manufacture and deal in metal goods. The company has a capital stock of $60,000, and the incorporators are Christian Franz, William Hewitt and Lena F. Moree, all of Newark.

The past year has been a very prosperous one in the metal industry despite conditions in general. Although new building has been greatly hampered because of the many strikes and other setbacks, such as high cost of material and advanced wages, the season has been an unusually good one. One metal manufacturer informed a representative of THE METAL INDUSTRY that he at first thought the slump in building operations would have the effect of curtailing his output, but was surprised to find the business continue good. The Skillman Hardware Manufacturing Company is very busy, and President William G. Wherry says his company has enough orders on hand to keep the works running for several months. "We are sure of a prosperous winter," he said, "and it looks to me as if the year 1920 would be a banner one for business. We have many big orders booked and everything is coming our way."

The labor situation has not been a serious one to contend with this year. Almost all the trouble among organized workmen was on building operations outside the metal plants. Of course there were demands made in some of the plants for increased pay and it was granted before any strike occurred. Mechanics are now being paid good wages and no serious labor troubles are expected during the coming year.

The Billingham Brass and Machine Company reports business as being good with prospects for a good winter trade. The company recently placed a number of brass bench molders at work.

The Ingersoll-Trenton Watch Company has denied the rumor that it intends to locate a plant in Elizabeth, N. J. The company was offered a plant in Elizabeth and George Eberhardt, manager of factories for the concern, and Fred Gartner, of the company, visited Elizabeth and after an investigation decided not to take the plant. It was then rumored that the Ingersoll company would transfer its equipment to Elizabeth for the manufacture of jewels used in watches. These jewels are now shaped in the various factories of the company. The manager of the company informed a representative of the METAL INDUSTRY that it would remain in Trenton and not have any of the parts made in Elizabeth.

The Charles W. Carll Company, sheet metal manufacturers, have disposed of their plant at South Warren and Front streets and will soon occupy their new plant along the Reading railway. The new plant is 175 feet in length and tapers down from one width of 50 feet to 10 feet. The plant cost $10,000. The company occupied the Warren street property for the past thirty years. The new plant also contains the sales office and display quarters.

William H. Schulte, general manager of the Trenton Brass and Machine Company, has returned from the Maine woods, where his family spent the summer. Mr. Schulte made frequent trips to the summer resort.

The strike of the several hundred hands at the plant of the Keystone Watch Cace Company and Riverside Metal Works, Riverside, N. J., was marked by violence and some of the employes were arrested for attacking others. The town officials found it necessary to swear in a number of special deputies because of the critical situation. Uniformed officers were instructed to mingle in the crowds and prevent agitators from stirring up trouble. The serious trouble started when some of the foreigners employed at the works attacked mechanics who remained loyal to the two firms. In an effort to break the strike the two companies made an effort to secure help from outside towns and strangers in the town who sought positions were coaxed away from the works. Since the strike the companies granted a forty-eight hour week with a fifty-hour pay. The strike developed over efforts to unionize the employes of the watchcase and metal works. There was no wage or time grievance. About 1,000 hands are employed at both plants and of this number 700 went on strike. After the strike was two weeks' old some of the strikers began to weaken and returned to work. One of the features of the strike was the discharge of John Miller, Jr., son of the chief owner of the watchcase plant. Young Miller favored a union and the superintendent discharged him, among others. The strikers raised funds by holding a series of dances. Business men of Riverside urged the owners of the plant to end the strike because of the great financial loss to the town.

The land and buildings of the American Standard Metal Products Company at Paulsboro, N. J., which made munitions during the war, has been sold to the General Tractors, Inc., for the sum of $60,000. The Metal Products Company was one of the busiest plants in New Jersey all through the war and worked day and night on high explosives. The plant of the same corporation at Bordentown is still in operation and it is not known whether this factory will be closed.

The American Can Company announces that it will close its Kenilworth, N. J., plant and sell the entire property. This decision was reached after officials of the company made an inspection and found that the plant would no longer meet the requirements of the business. During the war the factory worked day and night on munitions and had a payroll of about 4,000 hands. The plant was originally used for the manufacture of tin cans.

The American Platinum Company, Oliver street, Newark, N. J., will erect a three-story brick factory, 50 x 132 feet, to cost $100,000, and a one-story brick boiler house, 25 x 42 feet, to cost $4,896.

Business men of Belvidere, N. J., are contemplating the erection of a foundry for the manufacture of brass castings. The plant will cost about $50,000. Oscar Smith, formerly with the Ingersoll-Rand Drill Company at Phillipsburg, is at the head of the movement.

The Atlantic Smelting and Refining Works, Inc., of Brooklyn, has purchased a plot of three acres on Avenue R, Newark, N. J. The latter company sold some of their own buildings to the Presto-Lite Company and will build new structures. The Balbach Smelting & Refining Company, of Newark, will make alterations to their factory to cost $3,000.

The Advance Metal Stamping Corporation, of Newark, N. J., has been incorporated with $25,000 capital by Samuel Cohen, Joseph Sennabend and Sarah Search.

The Transfer Metal Castings Company, of Newark, N. J., has been organized by William Karnatz and Joseph Keegan.

The Metal Stamping Manufacturing Company, of Newark,

N. J., has been incorporated with $100,000 capital by Harry Green, Sali Kneip and N. M. Frutchman.

The American Type Founders Company, with headquarters in New York, has taken over the plant of the Collins & Son Company at Belvidere, N. J. The new company has had some improvements made and has already begun operations.

## CHICAGO

DECEMBER 8, 1919.

The Fifth National Exposition of the Chemical Industries, held during the week of September 22 at the Coliseum and First Regiment Armory, in Chicago, was the most successful event of its sort ever held in the country, according to many visitors, and it was certainly the largest in every way of the series of expositions held under that name. When it is stated that there were about 350 exhibitors, and that around 70,000 persons passed the turnstiles giving admission to the really wonderful show made up by the exposition, it can be understood that it was something a little out of the ordinary.

It was anticipated all along that there would be too many exhibits for the big Coliseum, which is used to house all meetings of the sort in Chicago. But when they overflowed the balcony which runs all around the building, and then filled the First Regiment Armory, a large structure lying behind the Coliseum, it became evident that the interest and support of the chemical industries was of a tremendous volume.

Naturally, in view of the scope of the exhibition, which is designed to further the interests of commercial chemistry and to show as well something of the progress made in the chemical arts during the year, the exhibits were directed toward that end, and demonstrated in a striking manner the great steps which have been taken in the past twelve months. From the popular standpoint, as well as to the student of chemistry, great interest attached to the numerous displays indicating a stimulus imparted by the war, the dye industry being prominently represented in this respect.

A noteworthy feature of the exhibit was the extent to which technical societies took advantage of the affair to hold meetings in Chicago while it lasted. Among these were the Chicago section of the American Chemical Society, the Electro-Chemical Society, the American Ceramic Society, the Technical Association of the Pulp and Paper Industry, and the American Institute of Mining and Metallurgical Engineers. Many trade and technical publications interested in these and the numerous other branches of industry affected by chemistry, or engaged in some branch of chemistry, were represented at the exhibit, as well.

Arrangements are already well under way for the 1920 exposition, which will be held at the Grand Central Palace, New York, during the week of September 20, and exhibitors represented at the Chicago meeting proved so receptive that a large number of them signed contracts for space next year at New York. Three full floors of the building will be used, and more, if required.

An interesting incident of the meeting was the presentation to Prof. Wm. A. Noyes, director of the chemistry department of the University of Illinois, of the Willard Gibbs gold medal for chemical research, following a reception at the Congress Hotel in Prof. Noyes' honor, attended by more than 400 leading chemical personages. Dr. William H. Nichols, of New York, president of the American Chemical Society, made the presentation speech. Other speakers were Dr. W. E. Stone, president of Purdue University; Dr. Harry Pratt Judson, president of the University of Chicago, and William R. Moss. —K. C. C.

## LOUISVILLE

DECEMBER 8, 1919.

Louisville coppersmiths and metal workers are managing to keep going on a very fair basis, and have forgotten the loss of distillery business, which for many years was the big thing. During the war period local houses had enough war work on hand that they did not need to worry, and have managed to secure enough general work during this year to keep going after the war work ran out. There has been much development of soap and fatty acid plants, and there have been many changes in breweries which are developing near beers, soft drinks, etc.

A good deal of work is promised for spring in connection with development of ice, and cold storage plants, where a good deal of brine equipment is used. For the past two or three summers there has been a big shortage of ice every summer, and also of cold storage space, and a number of new plants are going in.

The labor situation in Louisville has been easy during the past few months, due largely to the fact Louisville employers have had enough backbone to break every strike started, regardless of costs, and must have the situation well in hand. Wherever men have demanded reasonable requests, they have gotten attention, but the employers have refused to recognize unions where the closed shop plan was at issue. The metal working trades have had no trouble to speak of, other than in some of the vehicle and implement plants. B. F. Avery & Sons recently had a moulders' strike, but filled the vacant positions without difficulty.

The coppersmiths are well unionized in Louisville, and are working on a forty-four-hours-per-week basis, and have gotten all reasonable requests without trouble.

It is reported that union labor troubles recently affected a contract that a Louisville concern held, for an Eastern concern, when it was learned that the Eastern company was turning out its work with non-union labor. The men working for the local union shop refused to work on the contract until the workers of the Eastern company that were out on strike had settled their troubles, and peace had been made with the Eastern union. It is understood that the trouble was finally patched up, when the local men found out that it was a case of close down or complete the contract.

Starting on December 1, the entire Southeastern region from the Ohio River South, and Mississippi East, was placed under fuel regulations by the Regional Fuel Committee, Atlanta, Ga. All industries went on an eight-hour basis, except where they were working more than one shift, where each shift was cut to eight hours. Public utilities and essential industries were permitted to continue. Office buildings, stores and general mercantile concerns were limited to seven hours. The Board of Trade filed a hot protest in Washington when it was learned that the order affected only the Southeastern district, but feels a little better now that it has learned that similar orders are being placed in effect in nearly all sections. It was felt that Louisville was being discriminated against, especially in view of the fact that Kentucky coal was being shipped elsewhere while Kentucky industrial consumers couldn't use it.

Reports indicate that even shorter hours will be necessary due to shortage of fuel, especially rail coal. More than sixty passenger trains have been taken off in the Louisville district, and traveling has been ordered held down to absolutely essential needs. On December 8 the C. & O. R. R. issued a general embargo against handling all shipments other than coal, due to shortage of engine coal, and need to get fuel coal through.

The fuel situation is generally bad, and the big local manufacturers of plumbing supplies, etc., are feeling it badly. The Standard Sanitary Mfg. Co., employing more than 2,000 men on brass and other plumbing goods, is working its entire force on shorter hours, and maintaining its shifts. The Columbia Sanitary Mfg. Co. has also been affected, and all of the jobbers of plumbing supplies.

The Independent Brass Foundry during November placed a second shift in operation, but as this shift had not been working for three months, it had to be taken off, and the company is struggling along with big orders on one shift of eight hours, but a larger force. The company has recently made arrangements for a larger and better plant to accommodate its growth.

Hines & Ritchey report that as the union schedule calls for a forty-four-hour week it hasn't affected single shifts to any extent. However, the Standard Milk Machinery Co. and allied concern is having some trouble due to reduced hours.

Material has been lower in price and easy to get. There is a good deal of heavy scrap copper available, due to distilleries being wrecked. Ingot is now costing around 20 cents a pound: tubes, 33 cents, and sheet, 28½ cents. Deliveries are coming through much better, with copper manufacturers able to ship

within two weeks. Cold rolled tinned copper is a little scarce, and delay is met with in deliveries. Scrap brass is worth around 18 and 20 cents.

The general situation is promising, and indications point to a good year, but it will probably be some time yet before the fuel situation returns to normal, or before car shortage again is obliterated.

Matt Corcoran, Jr., of Matt Corcoran & Co., reports a very fair run of business, and stated that the plant was keeping busy enough to be satisfactory on general work.

## VERIFIED NEWS OF THE METAL INDUSTRY GATHERED FROM SCATTERED SOURCES

**The Electric Furnace Company, Alliance, Ohio,** installed new Baily electric furnaces for melting a wide range of non-ferrous metals and alloys, in the following plants:

**The Drew Electric & Mfg. Company,** Cleveland, Ohio, has purchased a 105 K. W. furnace for melting yellow brass.

**The Nolte Brass Company,** of Springfield, Ohio, has installed a 105 K. W. furnace, of 1,500 pounds capacity for melting yellow brass.

**The Kennedy Valve Company,** Elmira, N. Y., has installed a 105 K. W. electric furnace for red brass.

**The American Bronze Corporation,** New York City, has contracted for two 1,500-pound electric furnaces for melting bronze.

**The Dominion Steel Products Company,** of Brantford, Ont., Canada, has installed a 50 K. W. furnace of 500-pound capacity for yellow brass.

**The Deming Company,** Salem, Ohio, will melt yellow and red brass in a furnace of 500-pound capacity.

**The Miller Pasteurizing Machine Company,** Canton, Ohio, will use its Baily 50 K. W. furnace for yellow brass.

**Landers, Frary & Clark,** of New Britain, Conn., will melt aluminum in a 50 K. W. furnace that has a capacity of 200 pounds of aluminum per hour.

---

**The Bayonne Casting Company,** of Bayonne, N. J., has changed its title to **Monel Metal Products Corporation.**

---

**The Pedlar People, Ltd.,** Oshawa, Ont., Canada, are building a new plant, for manufacturing the same materials as they

---

**The Chicago Pneumatic Tool Company,** Chicago, Ill., has moved its Minneapolis, Minn., office from the Metropolitan Bank Building to Fifth avenue and Fifth street, south.

---

**The Riverside Foundry Company,** Wrightsville, Pa., is erecting a one-story brick addition 55 x 120 feet, which is now nearing completion. The company operates a metal pattern shop and casting shop.

---

**The Rowe Calk & Chain Company,** Plantsville, Conn., have been handling for the last 25 years, namely, sheet metal buildings and fireproofing materials, such as metal lath, metal culverts, metal roofings and sidings.

---

New officers of the **Bremer-Waltz Corporation,** New York City, elected at the last meeting, are: J. L. T. Waltz, president and treasurer; C. P. Verkruzen, vice-president and assistant treasurer; P. B. Adrian, secretary.

---

**The Shawinigan Electro Metals Company,** formerly of Cleveland, have relocated their U. S. sales office at 1500 Westminster Building, Chicago. They will carry a stock of Shawinigan magnesium shaded caps in warehouses at New York, Detroit and Chicago.

---

**The Rowe Calk & Chain Company,** Plantsville, Conn., has taken over the business of the Hi-Lo Jack Co., Worcester, Mass., manufacturer of lifting jacks. They operate a tool room, grinding room, galvanizing, plating, polishing and lacquering departments.

**The Sherwood Brass Company,** of Detroit, Mich., are building a one-story brick addition to their factory, to cost $5,500. The company operates a brass, bronze and aluminum foundry, brass machine shop, tool room, grinding room, plating, soldering, polishing and lacquering departments.

---

Plant additions including a foundry will be erected by the **Robbins & Myers Company,** Springfield, Ohio. This firm operates a brass machine shop, tool room, grinding room, casting shop, cutting-up shop, tinning, soldering, plating, polishing, japanning and lacquering departments.

---

**Lumen Bearing Company,** Youngstown, Ohio, is planning to build a brass casting plant on Poland avenue, for the manufacture of bronze bearings. W. H. Barr is president and H. P. Parrock general manager. The company operates a smelting and refining department and a brass and bronze foundry.

---

**Bossier Electric Company,** manufacturers of "World" Plating Dynamos, Swiss copper anodes and other plating euqipment, having outgrown their quarters at 205 West 19th street, New York City, will occupy a five-story building on East 10th street between Vernon and East avenue, Long Island City, about February 1, 1919.

---

**The Sterling Foundry Company,** Wellington, Ohio, has been incorporated under the laws of the State of Ohio. The capital stock is $150,000. This company has purchased the gray iron jobbing business of the Sterling Machine & Stamping Company, which now makes sheet metal stampings and aluminum castings.

---

**The Niagara Brass Manufacturing Company, Inc.,** formerly of Buffalo, N. Y., announce the removal of their foundry and machine shop to Lockport, N. Y. They have there 30,000 feet of floor space, and with an organization of skilled men and new equipment they are preparing with new energy to serve their patrons.

---

**The Ashland Brass Foundry,** Ashland, Ohio, recently let a contract for a brick office building and foundry, 45 x 70 ft. It will make brass and aluminum castings, specializing in aluminum match plates. The new building will be ready for occupancy about November 1, 1919. They operate a brass, bronze and aluminum foundry.

---

**The American Brass Company,** Waterbury, Conn., has opened a branch office at 912 Citizens Building, Cleveland, Ohio, where C. C. Mahan will take care of the interests of the company and all its branches. This company operates brass machine shops, casting shop, tool room, rolling mill, tinning, brazing and polishing departments.

---

**The Booth-Coulter Coppersmithing Company,** 19 Queen St., Montreal, Canada, has awarded the contract for the construction of a one-story 41 x 75 foot copper-shop for general coppersmithing work, to S. Saratinal, 470 Amherst street. Estimated cost, $19,000. They will require some trip-hammers when they move in, about December 1, 1919.

---

**The Dallas Brass & Copper Company,** 225 N. Jefferson St., Chicago, has started construction on a new four-story plant,

100 x 212 feet, at Orleans street and Institute place. It is a concrete and steel building, and will cost about $350,000. The company operates a tool room, rolling mill, tinning, soldering, plating, polishing and lacquering departments.

---

**The Bridgeport Castings Company,** Bridgeport, Conn., has been incorporated with a capital stock of $100,000. The company recently purchased the premises of the Bridgeport Tool Works on North avenue, and will engage in the making of brass, bronze and aluminum castings. They will operate a brass, bronze and aluminum foundry and grinding room.

---

**The Saint Louis Machine Tool Company** is building an addition to its plant, 932 Loughborough avenue, St. Louis, Mo., which will about double its capacity, giving it 13,000 square feet of additional floor space. This enlargement was made necessary by the increasing business of the company, who specialize in grinding, polishing and tapping machinery.

---

**The Columbus Metal Products Company,** Columbus, Ohio, recently incorporated, advises that later it expects to equip a factory for the manufacture of a patented master flush valve and a master automobile lock. DeWitt H. Wyatt is consulting engineer. The company operates a tool room and stamping, plating, polishing, japanning and lacquering departments.

---

An addition now being erected at the plant of the **Standard Brass Foundry Company, Cleveland, Ohio,** when completed will house the offices, pattern storage, shipping and cleaning departments. The building now being used as a shipping department will be remodeled as an extension to the molding room. The company operates a brass, bronze and aluminum foundry.

---

**The Hanson & Van Winkle Company** will remove its New York store and warehouse, about January 1, 1920, from 81 Walker street, to 40 Franklin street, corner Lafayette street. In this location they will have much larger quarters and warehouse space, where they can carry a larger stock and will be in a position to handle New York, Brooklyn and Jersey City trade in an expeditious manner.

---

**The Franklin Brick & Tile Company,** Columbus, Ohio, has been incorporated with $1,500,000 capital stock and has purchased a brick plant at Taylor's Station. It is erecting eight additional kilns and one new plant. The old and new plants will manufacture face, common, hollow and acid brick, drain tile and hollow tile. F. M. Morrison is president and general manager, and R. S. Dingledine, secretary-treasurer.

---

**The Boyerstown Brass Foundry Company,** Boyerstown, Pa., has been incorporated in Delaware with a capital stock of $50,000, by Warren M. Johnston, Boyerstown; Addison R. May, Pottstown, and Garret J. Henves, Philadelphia, to manufacture brass and other castings. They will operate a brass, bronze and aluminum foundry and a polishing department. They would like to have some particulars regarding polishing equipment for aluminum frying pans.

---

**W. E. Moore & Company,** Engineers, Pittsburgh, Pa., are now busy designing a new carbide plant for the Farmers' Standard Carbide Company at Freydenburgh Falls, N. Y. A water fall of 46 feet will be developed to a capacity of 3700 H. P. A Moore 3-phase carbide furnace will be installed, together with crushing, screening, can-making and packing machinery, to handle an output of 30 tons per day. Mr. W. B. Ragatz, of the Union Carbide Company, has been engaged as Works Manager.

---

**The Aeronautical Equipment, Inc.,** has purchased from the Bureau of Ordnance, War Department, all of one inch and under round brass rods. This amounts to about 5½ million pounds and this, with the 1½ million pounds they own of over one inch, brings the total amount of stock owned by that company for immediate shipment up to 7 million pounds. At present these brass rods are stored at all the district offices of the Ordnance in the East and as far West as Chicago and St. Louis.

---

**The Aluminum Specialty Company,** Manitowoc, Wis., has awarded contract for the erection of a two-story factory at Chilton, Wis., 60 x 200 ft., of reinforced concrete and brick. This plant is to be ready in 60 days and will employ from 75 to 100 men. A separate boiler house and power plant, 30 x 50 ft., will also be erected. Charles Krug, vice-president, will be works manager and Walter Spindler is president and general manager. This company operates a tool room, cutting-up shop, spinning and stamping departments.

---

**The Penn Foundry & Machine Company,** Allentown, Pa., is establishing a subsidiary organization at Bath, Pa. Property has been secured at that place, and work is under way, renovating and remodeling the buildings preparatory to the installation of machinery and equipment. This plant will specialize in the manufacture of metal specialties, novelties, etc., with department for the production of light and heavy castings. The works, it is understood, will be operated under a new company name. E. M. Gackenbach will be manager.

---

**The Arneson Foundry Company,** Kenosha, Wis., manufacturer of brass and iron castings, will enlarge its branch shop at Hamilton avenue and the C. & N. W. R. R. tracks by the erection of a brick and steel addition 80 x 225 ft., making this the main works. The general contract has been let to the Commercial Boiler & Structural Company, Kenosha. It will cost about $45,000 and will make possible the enlargement of the working force by 125 to 150 men. Their plant at Hamilton avenue and C. & N. W. tracks is a converter steel foundry. They also operate a brass foundry.

---

**A. P. Munning & Company,** 50 Church St., New York City, have recently made a number of electrical installations, among which are the following:

Simon Zinn, 26th street and 11th avenue, New York City, one 3,000-ampere Optimus Generator set.

National Electrotype Company, New York City, 2,500-ampere set, and a similar set at the Royal Electrotype Company, Philadelphia, Pa. This company is the electrotying department of the Saturday Evening Post. A particular feature of this installation is the excellent and adequate bus-bar arrangements.

---

**The Kirchdorfer Hutchinson Company,** 643 South Shelby street, Louisville, Ky., filed articles of incorporation with a capital stock of $5,000. The company will engage in the sheet metal and tin business. The incorporators are O. E. Hutchinson, Joseph C. Kirchdorfer and Henry Reiss. They will manufacture a varied line of sheet metal, ten gauge steel and lighter, and expect to specialize on automobile bodies, fenders, hoods, radiator shells, tanks skylights, ventilators, conveyor and ventilation pipe, and will be interested in information and catalogs referring to machinery used in the manufacturing of the above articles. Power, electric shaft drive.

---

**The Kewaskum Aluminum Company,** Kewaskum, Wis., capitalized at $150,000, was completely subscribed for in fifteen minutes at a citizens' meeting. No outside capital is interested. The site and building will cost $50,000 and operations with 75 skilled workmen are to start next spring. Leading movers in the enterprise are A. L. Rosenheimer, president of the Bank of Kewaskum, Dr. N. E. Hausman and B. M. Rosenheimer, merchant. A $50,000 canning plant, to be established by local capital, is also under consideration. The new aluminum plant will operate an aluminum foundry, tool room, grinding room, casting shop, spinning, stamping and plating departments.

---

**Aluminum Manufacturers, Inc.,** is to be organized under the laws of the State of Delaware, to acquire and extend the plants and business of The Aluminum Castings Company, an

Ohio corporation, and to engage in the manufacture of other products of aluminum. They have issued $5,000,000 of 7 per cent. cumulative preferred stock.

The Aluminum Castings Company is by far the largest producer in this country of aluminum castings. Production will be substantially increased by the operation of two new plants which it is planned to construct with a portion of the proceeds from the sale of preferred and common stock and from two plants which were put into operation in July last.

---

The new engine plant at the **Chesapeake & Ohio R. R. Shops,** Huntington, W. Va., is near completion. The plant includes a brass foundry, in which they melt brass, bronze and kindred metals, including aluminum. They have a portion of their machine shop set aside for the machining of brass exclusively. They have a large tool room. They refine lead from battery plates, also copper from various sources. They have a cutting-up shop which is used exclusively for shearing of bars and plates. They do considerable brazing of copper pipe on locomotives and passenger cars. They have an Ajax rolling mill for reclamation work. They have a large tinshop which takes care of soldering, and a polishing and lacquer shop.

---

After October 1, 1919, the chemical laboratory which has for 16 years been known as **The Hartford Laboratory Company** will be known as the Laboratories of Charles L. W. Pettee. From the above date all mail should be addressed to Laboratories of Charles L. W. Pettee, P. O. Drawer No. 9, Hartford, Conn., and all express to Laboratories of Charles L. W. Pettee, 112 High street, Hartford, Conn. Beginning October 1 all remittances should be made in accordance with this change. This change in name will involve absolutely no change in organization, methods or management and Mr. Pettee will continue to give all of his time to the supervision of all of the analyses and tests made in his laboratories, reserving all unusual and special work for himself.

---

**The Crossley Lead & Machine Company,** Erie, Pa., has increased its capital stock from $15,000 to $50,000. Henry Crossley is secretary. They have increased their capital stock in order to make it possible to expand their business to keep up with the ever-increasing demand for the various articles they make and the work that they do. They have a general machine shop for work in all kinds of metals, and do jobbing work or contract for the building of special machinery of all kinds. They also have a sheet metal shop for work in galvanized and blue annealed sheets, copper, brass or tin, doing all kinds of work in these metals. They are also workers in lead, making window weights of all sizes and shapes, and lead and babbitt hammers in addition to various other articles.

---

**The Quigley Furnace Specialties Co.,** 26 Cortland Street, New York, is putting on the market a complete line of Carbonizing Pots and Annealing Boxes for heat-treating. These products are made of a special analysis steel known as Q-steel, designed for maximum resistance to oxidation, coupled with minimum cost per heat hour of service, being the result of several years' investigation and practical experience in heat-treatment.

In addition to the low-priced steel boxes and special castings, they will also market two high grade alloys for similar work where the operating conditions make more economical this class of material. The Quigley organization is in a position to render special service to the user of these products and recommend the most economical material for specific purposes. The department of heat-treatment will be under the management of Mr. H. H. Harris.

---

**The Gehnrich Indirect Heat Oven Co.,** 60 Franklin street, Brooklyn, N. Y., has acquired property on Skillman avenue, Honeywell to Buckley streets, Long Island City, aggregating about 20,000 square feet, for the establishment of a new plant. Arrangements have been made for the construction of a three-story reinforced-concrete works. The company has recently increased its capital from $75,000 to $150,000.

The directors, at their last board meeting, voted to present a life insurance policy to every one of their employees who have been with them for a period of two months or longer.

The insurance took effect August 4, and policies were distributed in amounts of

$2,000—to those having served 3 years or more.
$1,500—to those having served 18 to 36 months.
$1,000—to those having served 6 to 18 months.
$500—to those having served 2 to 6 months.

The insurance is retroactive and in addition to the life insurance feature the policies carry disability benefits during the time the insured is in employ of the company. The total amount of insurance is close to $100,000.

---

A new corporation was organized in Chicago under the laws of the State of Illinois to be known as **The Booth Electric Furnace Company,** with paid-up capital of $1,000,000. Of this amount one-half is preferred stock, and one-half common. The new company has acquired all the patents, assets and good-will of the Booth-Hall Company, well known as manufacturers of electric steel and brass melting furnaces, and has taken over the business formerly carried on by that company. It will greatly enlarge the scope of operations, and develop the electric furnace business along standard manufacturing lines rather than on a special engineering contracting basis. The company is prepared to deliver this type of furnace in four sizes, viz., 250 lb., 500 lb., 1,000 lb., and 2,000 lb. equipments.

Associated in the management of the company will be a number of the best known engineering and operating executives in the public service field. Mr. L. E. Myers, of Chicago, president of the L. E. Myers Company, has been elected president of the new corporation; Mr. C. H. Booth, formerly president of the Booth-Hall Company, vice-president; Mr. W. K. Booth, formerly chief engineer of the Booth-Hall Company, secretary; and Mr. L. J. Clark, of the L. E. Myers Company, treasurer. In addition to the president, vice-president and secretary, the board of directors will include Mr. Martin J. Insull, vice-president of the Middle West Utilities Company, and Mr. E. W. Loyd, of the Commonwealth Edison Company, both of Chicago.

---

**The Booth Electric Furnace Co.,** announced in these columns above has opened up the following district offices in connection with the sale of electric furnaces for melting steel, iron and non-ferrous metals.

For New York and New England, Edward B. Scott & Company, Flatiron Building, New York City, with Mr. E. F. Tweedy, Secretary of the company, directly in charge; for Eastern Pennsylvania, New Jersey, Maryland, Delaware, and Southern Atlantic Coast states, Northern Engineering Company, 308 Chestnut Street, Philadelphia, with Mr. F. W. Doran in charge; for Northeastern Ohio, Western Pennsylvania, and Western New York state, Mr. Chas. L. Foster, formerly Sales Manager of the Electric Furnace Company, of Alliance, Ohio, with offices at 879 The Arcade, Cleveland, Ohio.

In connection with these district offices a complete staff of engineers and metallurgists will be maintained so that the needs of customers can be promptly met and adequately taken care of.

Further announcements will be made of the opening of other district offices, arrangements for which are being completed.

## WATERBURY'S INDUSTRIAL GROWTH SHOWN

An effort to secure an estimate of the population of Waterbury resulted in a revelation concerning two of the city's largest industries, namely, the Scovill Manufacturing Company and the Chase Companies, both brass manufacturing concerns. It is stated that before the war, the Scovill company normally employed about 3,500 hands, and that after securing government contracts for munitions the working force was increased rapidly until at the signing of the armistice the company was employing 14,000 hands. With the stopping of war work, the working force was rapidly cut down until last spring when only about 4,500

were left. Since then the enrollment of employees has been climbing, and today finds the company employing over 7,000 or double what was considered a normal working force before the war.

Of the Chase Companies, it is said that before the war they gave employment to about 3,000 hands, and that the peak of munition activity found the company employing 8,875. At present the number employed is 4,550.

It is estimated that the city's population is from 15,000 to 20,000 smaller than at the close of the war, and that it is now between 110,000 and 115,000, a gain from 73,111 in 1910. The present industrial growth is looked upon as permanent.

## INTERNATIONAL NICKEL EARNINGS

For six months ended September 30, 1919, International Nickel Company reports surplus after charges, federal taxes and preferred dividends of $510,602, equivalent to 30 cents a share ($25 par) on common, against $3,415,905, of $2.04 a share, in corresponding six months of 1918.

| | 1919 | 1918 | Decrease |
|---|---|---|---|
| Earnings | $2,441,454 | $7,744,128 | $5,302,674 |
| Other income | 42,279 | 65,214 | 22,935 |
| Total income | 2,483,733 | 7,809,342 | 5,325,609 |
| Adm. gen. ex. | 256,104 | 381,843 | 125,739 |
| Tax res. | 450,475 | 2,749,126 | 2,298,651 |
| Net income | 1,777,154 | 4,678,373 | 2,901,219 |
| Dep. min. exh. | 999,174 | 995,090 | *4,000 |
| Profits | 777,980 | 3,683,283 | 2,905,303 |
| Pfd. divs. | 267,378 | 267,378 | ..... |
| Balance | 510,602 | 3,415,905 | 2,905,303 |
| Com. divs. | ..... | 2,510,076 | 2,510,076 |
| Surplus | 510,602 | 905,829 | 395,227 |

*Increase.

## NEW STOCK ISSUE OF THE BRISTOL BRASS CORPORATION

A special meeting of the stockholders of the Bristol Brass Corporation was held at the company's office in East Bristol. President Albert F. Rockwell presided and explained the proposed issue of $1,000,000 of 7 per cent cumulative preferred stock.

Only $500,000 of the above stock will be issued at the present time. It is the general opinion that this 7 per cent preferred issue, with above conditions, is a gilt-edged security, and will be readily taken by the investing public. The entire issue is underwritten by a syndicate composed of leading Hartford brokers, R. F. Griggs & Company, of Waterbury, and Hull, Ingraham & Company, of this city.

## CATALOGUES

The Optical Pyrometer. Published by Leeds & Northrup Company, Philadelphia, Pa., which describes the instrument and its practical applications, in gauging temperatures in the open, in fuel beds, in heat, treating furnaces, in muffle furnaces, in the rolling and forging of steel, in blast furnaces, in electric furnaces, of molten steel and slag, of molten cast iron, of molten non-ferrous metals, of molten glass, in ceramic furnaces, etc., and for the checking of thermocouple pyrometers.

Catalogue for Buyers of Foundry Facings, Foundry Supplies, Fire Brick, Buffing Compositions, Platers Supplies and Equipment. Published by Frederic B. Stevens, Detroit, Mich. This book is not only a catalogue, it is in a sense a reference book. It will give the reader much information relative to foundry material, electroplating supplies and firebrick, and their respective uses.

Catalogue of Walter C. Gold, which is profusely illustrated and contains much data and information for progressive grinders, polishers and platers as well as for purchases of materials necessary for such work.

Catalogue of Condensers, Pumps, Cooling Towers, etc. Bulletin No. 112 B. Published by the Wheeler Condenser and Engineering Company, Carteret, N. J. This bulletin shows some of the latest developments in condenser practice.

## METAL MARKET REVIEW

WRITTEN FOR THE METAL INDUSTRY BY W. T. PARTRIDGE

### COPPER

Copper sales in the past three months are estimated to have been approximately 350,000,000 pounds, including both foreign and domestic business. Of this amount, 80,000,000 were sold in September, 130,000,000 in October and 140,000,000 in November. Prices, after being firmly held by producers at 23.50c. per pound during preceding two months, declined in October-November, 5¼c. to 18.25c. for prompt electrolytic, 18c. for casting and 19c. for Lake, the quotations at end of November. Electrolytic for first quarter 1919 was freely offered at 18.50c., while second quarter delivery ranged from 18.25c. to 18.75c. A feature in November was the growing belief that surplus stocks were not so large as previously estimated and that current domestic consumption, on the other hand, is larger, averaging close to 80,000,000 pounds monthly since June, rather than 60,000,000 as given in general trade estimates. Output of refined copper continues to average between 125,000,000 and 130,000,000 pounds monthly, but with some prospect of being reduced owing to labor and fuel difficulties. Exports during first ten months 1919 aggregated 195,000 tons.

### TIN

Large stocks held on dock and on ships in the harbor because of the longshoremen's strike caused rapid fluctuations in prices of tin in November. Premiums were paid for available spot metal ranging from ¼c. to 2c. per pound, according to urgency of buyer's need for tin and quick delivery. A net decline of 2c. per pound on spot metal was registered at the end of November when Straits was selling at 54.25c.; American pure at 54.50c. and 99 per cent. metal at 53.50c. per pound. Arrivals during the month were 4,060 tons, which, added to stocks of 7,560 tons held at the beginning of the month, made supplies of 11,620 available for American consumption.

### LEAD

A firm and steady tone in the lead market prevailed in November, the leading interest maintaining unchanged throughout the month its basis of prices, 6.50c. East St. Louis, 6.75c. New York, established late in October. Prices in the outside market fluctuated within close range of producers' quotations, advancing ¼c. beyond at East St. Louis by the middle of the month, but closing only 2½ points higher. New York prices, after being shaded fractionally, advanced at the end of November to the level of the American Smelting & Refining Co. A very satisfactory volume of business was transacted. Prices are still advancing.

### ZINC

Fluctuations in prices in November netted an advance of ½c. per pound at the end of the month. A large volume of export business was done, mainly on English account. Domestic buying, which was very light early in the month, was steadily improving, but still far below normal at the end. Quotations November 30 were 8.05c. East St. Louis, 8.40c. New York for prime Western. Brass special, after being scarcely heard of for many months, was being inquired for toward the end of November, prices being 5 points higher than for primary spelter.

### ALUMINUM

Less activity in the aluminum market failed to affect prices of aluminum in November which were maintained without change at figures prevailing in the previous month—32-33c. for virgin ingots 98-99 per cent.; 31-32c. for remelted 98-99 per cent.; 29-30c. for remelted No. 12 and 42.20c. for sheets 18ga and heavier.

### ANTIMONY

Antimony was in more active demand, and prices had netted an advance of ½c. per pound by the end of the month, at 9.25c. for wholesale and 9.37½c. for jobbing lots, duty paid, New York, the outlook being for increasing demand, decreasing supplies and higher prices in the immediate future. Shipments from the Orient were held nominally higher than spot metal in New York, but offerings were few even at these prices.

### SILVER

Fluctuations in the silver market resulted in a net advance of 7⅝c. per ounce in November, from $1.21⅜ to $1.29, having almost touched the gold parity point. Scarcity continues and much higher levels are anticipated. Exports for nine months ending September 30, amounted to $177,104,404, of which $12,927,941 was the outgo in September. Imports during nine months ending September 30 were $63,984,155, of which $7,539,452 were received in September.

### QUICKSILVER

Scarcity of metal developing toward the end of November, prices of quicksilver which had been previously $80 per flask of 75 pounds, were advanced $15 per flask to $95.

### PLATINUM

Active and increasing demand for platinum and scarcity of supplies caused an advance of $5 per ounce in November from $130 to $135.

### OLD METALS

The only advance in prices of old metals in November was ¼c. per pound to 6.25c. on new zinc, while declines were many. Clean red car boxes were down 2c. to 12.50c., and cocks and faucets were off 1½c. to 11.50c. Strictly crucibled copper, under very light demand, was down ¼c., and light copper ½c. to 14c. for the latter and to 17c. for the former. Brass turnings and No. 1 pewter were off 1c. each to 9c. for turnings and 34c. for pewter. Light brass declined ½c. to 7.50c. and old cast aluminum was down from 24 to 23.50c. Business, which had been dull for many weeks, at the end of November showed signs of improvement.

## WATERBURY AVERAGE

Lake Copper. Average for 1918, 24.75. 1919—January, 23.00. February, 18.00. March, 15.50. April, 15.50. May, 16.37½. June, 17.75. July, 22.00. August, 22.00. September, 22.50. October, 22.25. November, 21.00.

Brass Mill Zinc. Average for 1918, 9.858. 1919—January, 9.00. February, 8.20. March, 8.00. April, 6.90. May, 6.80. June, 7.25. July, 8.10. August, 8.10. September, 7.85. October, 8.15. November, 8.55.

## SEPTEMBER MOVEMENTS IN METALS

| | Highest. | Lowest. | Average. |
|---|---|---|---|
| COPPER— | | | |
| Lake | 23.12 | 21.75 | 22.481 |
| Electrolytic | 22.50 | 21.50 | 21.953 |
| Casting | 22.00 | 20.50 | 21.281 |
| TIN | 56.75 | 54.62½ | 55.806 |
| LEAD | 6.25 | 6.00 | 6.14 |
| ZINC (brass special) | 7.62½ | 7.15 | 7.331 |
| ANTIMONY | 8.62½ | 8.45 | 8.532 |
| ALUMINUM | 33.00 | 32.00 | 32.50 |
| QUICKSILVER (per flask) | $105.00 | $95.00 | $101.75 |
| SILVER (cts. per oz.) | $1.19½ | $1.11¾ | $1.145 |

## OCTOBER MOVEMENTS IN METALS

| | Highest. | Lowest. | Average. |
|---|---|---|---|
| COPPER— | | | |
| Lake | 23.00 | 21.50 | 21.943 |
| Electrolytic | 22.25 | 20.00 | 21.505 |
| Casting | 21.50 | 20.00 | 20.659 |
| TIN | 56.50 | 54.50 | 55.622 |
| LEAD | 6.75 | 6.00 | 6.409 |
| ZINC (brass special) | 8.15 | 7.35 | 7.836 |
| ANTIMONY | 8.75 | 8.50 | 8.596 |
| ALUMINUM | 33.00 | 32.00 | 32.50 |
| QUICKSILVER (per flask) | $105.00 | $75.00 | $86.77 |
| SILVER (cts. per oz.) | $1.23⅜ | $117.00 | $119.13 |

## NOVEMBER MOVEMENTS IN METALS

| | Highest. | Lowest. | Average. |
|---|---|---|---|
| COPPER— | | | |
| Lake | 21.50 | 19.00 | 20.486 |
| Electrolytic | 21.00 | 18.25 | 19.958 |
| Casting | 20.12½ | 18.00 | 19.375 |
| TIN | 56.25 | 53.37½ | 54.277 |
| LEAD | 6.75 | 6.75 | 6.75 |
| ZINC (brass special) | 8.15 | 7.65 | 7.879 |
| ANTIMONY | 9.25 | 8.75 | 9.062 |
| ALUMINUM | 33.00 | 32.00 | 32.50 |
| QUICKSILVER (per flask) | $95.00 | $80.00 | $83.611 |
| SILVER (cts. per oz.) | 137½ | 121⅜ | 127.9 |

## INQUIRIES AND OPPORTUNITIES

Under the directory of "Trade Wants" (published each month in the rear advertising pages), will be found a number of inquiries and opportunities, which, if followed up, are a means of securing business. Our "Trade Want Directory" fills wants of all kinds, assists in the buying and selling of metals, machinery, foundry and platers' supplies, procures positions and secures capable assistants. See Want Ad. page.

# Metal Prices, December 8, 1919

## NEW METALS

| | Cents. |
|---|---|
| COPPER—DUTY FREE. PLATE, BAR, INGOT AND OLD COPPER. Manufactured 5 per centum. | |
| Electrolytic, carload lots | .18½ |
| Lake, carload lots | .19 |
| Casting, carload lots | .18¼ |
| TIN—Duty Free. | |
| Straits or Australian, carload lots | 52.75 |
| LEAD—Duty Pig, Bars and Old, 25%; pipe and sheets, 20%. Pig lead, carload lots | 7.10 |
| ZINC—Duty 15%. | |
| Brass Special | 8.85 |
| Prime Western, carload lots | 8.60-8.70 |
| ALUMINUM—Duty Crude, 2c. per lb. Plates, sheets, bars and rods, 3½c. per lb | |
| Small lots, f. o. b. factory | ... |
| 100-lb. f. o. b. factory | ... |
| Ton lots, f. o. b. factory | .32 |
| ANTIMONY—Duty 10%. | |
| Cookson's, Hallet's or American | Nominal |
| Chinese, Japanese, Wah Chang WCC, brand spot | 9.62½ |
| NICKEL—Duty Ingot, 10%. Sheet, strip and wire, 20% ad valorem. | |
| Ingot | .42 |
| Shot | .43 |
| ELECTROLYTIC | .45 |
| MANGANESE METAL | Nominal |
| MAGNESIUM METAL—Duty 20% ad valorem (100 lb. lots) | $1.90 |
| BISMUTH—Duty free | Nominal $2.95 |
| CADIUM—Duty free | Nominal $1.40 |
| CHROMIUM METAL—Duty free | Nominal |
| COBALT—97% pure | $3.00 |
| QUICKSILVER—Duty 10% per flask of 75 pounds | $100.00 |
| PLATINUM—Duty free, per ounce | $150.00 |
| SILVER—Government assay—Duty free, per ounce | $1.30½ |
| GOLD—Duty free, per ounce | $20.67 |

# Metal Prices, December 8, 1919

## INGOT METALS

| | | | | | |
|---|---|---|---|---|---|
| Silicon Copper, 10% | according | to | quantity | 49 | to55 |
| Silicon Copper, 20% | " | " | " | 36 | to40 |
| Phosphor Copper, guaranteed 15% | " | " | " | 30 | to37 |
| Phosphor Copper, guaranteed 10% | " | " | " | 29 | to36 |
| Manganese Copper, 30% | " | " | " | 60 | to70 |
| Phosphor Tin, guarantee, 5% | " | " | " | 65 | to70 |
| Phosphor Tin, no guarantee | " | " | " | 74 | to79 |
| Brass Ingot, Yellow | " | " | " | 13 | to14 |
| Brass Ingot, Red | " | " | " | 20 | to22 |
| Bronze Ingot | " | " | " | 22 | to24 |
| Parsons Manganese Bronze Ingots | " | " | " | 22 | to24 |
| Manganese Bronze Castings | " | " | " | 29 | to39 |
| Manganese Bronze Ingots | " | " | " | 17 | to22 |
| Manganese Bronze Forgings | " | " | " | 30 | to40 |
| Phosphor Bronze | " | " | " | 24 | to30 |
| Casting Aluminum Alloys | " | " | " | 32 | to34 |

## OLD METALS

| Buying Prices. | | Selling Prices. |
|---|---|---|
| 17 to17½ | Heavy Cut Copper | 18½to19 |
| 16½to17 | Copper Wire | 18 to18½ |
| 14½to15 | Light Copper | 16½to17 |
| 16 to16½ | Heavy Machine Comp. | 17½to18 |
| 11½to12 | Heavy Brass | 12½to13 |
| 9 to 9½ | Light Brass | 10½to11 |
| 9 to 9½ | No. 1 Yellow Brass Turnings | 11 to11½ |
| 14 to14½ | No. 1 Comp. Turnings | 16 to16½ |
| 4.25 | Heavy Lead | 4.90 |
| 4.25 | Zinc Scrap | 5.00 |
| 10.00 to 13.00 | Scrap Aluminum Turnings | 11.00 to 14.00 |
| 21.00 to 23.00 | Scrap Aluminum, cast alloyed | 23.50 to 25.00 |
| 24.00 | Scrap Aluminum, sheet (new) | 26.50 |
| 36.00 | No. 1 Pewter | 40.00 |
| 18.00 | Old Nickel anodes | 20.00 |
| 26.00 to 28 | Old Nickel | 30.00 to 32.00 |

## BRASS MATERIAL—MILL SHIPMENTS

In effect Dec. 1, 1919.

To customers who buy 5,000 lbs. or more in one order.

| | Net base per lb. | | |
|---|---|---|---|
| | High Brass. | Low Brass. | Bronze. |
| Sheet | $0.24¼ | $0.26¼ | $0.28 |
| Wire | .24¼ | .26¼ | .28 |
| Rod | .22¾ | .27 | .29 |
| Brazed tubing | .36 | ... | .40¾ |
| Open seam tubing | .36 | ... | .40¾ |
| Angles and channels | .37 | ... | .41¾ |

To customers who buy less than 5,000 lbs. in one order.

| | Net base per lb. | | |
|---|---|---|---|
| | High Brass. | Low Brass. | Bronze. |
| Sheet | $0.25½ | $0.27½ | $0.29¼ |
| Wire | .25½ | .27½ | .29¼ |
| Rod | .24 | .28¼ | .30¼ |
| Brazed tubing | .37¼ | ... | .42 |
| Open seam tubing | .37¼ | ... | .42 |
| Angles and channels | .38¼ | ... | .43 |

## SEAMLESS TUBING

Brass, 30½c. to 32½c. per lb. base.

Copper, 32c. to 34c. per lb. base.

## TOBIN BRONZE AND MUNTZ METAL

| | | |
|---|---|---|
| Tobin Bronze Rod | 28½c. | net base |
| Muntz or Yellow Metal Sheathing (14"x48") | 24¾c. | " " |
| Muntz or Yellow Rectangular Sheets other than Sheathing | 25¾c. | " " |
| Muntz or Yellow Metal Rod | 22¾c. | " " |

Above are for 100 lbs. or more in one order.

## COPPER SHEET

| | |
|---|---|
| Mill shipments (hot rolled) | 28½c. net base |
| From stock | 30½c. " " |

## BARE COPPER WIRE—CARLOAD LOTS

21¾c. to 22¼c. per lb. base.

## SOLDERING COPPERS

| | |
|---|---|
| 300 lbs. and over in one order | 30½c. per lb. base |
| 100 lbs. to 300 lbs. in one order | 31½c. " " " |

## ZINC SHEET

Duty, sheet, 15%. Cents per lb.

Carload lots, standard sizes and gauges, at mill, 11c. basis, less 8 per cent.

| | |
|---|---|
| Casks, jobbers' prices | 13c. |
| Open casks, jobbers' prices | 13½c. |

## ALUMINUM SHEET AND ROD

Sheet Aluminum, base price, 48c. per lb. Coils, 44c. per lb.

ROD.

B. & S. Gauge.

¾" to 1" Advancing by 32nds
1" to 5/8" " " 16ths } 98% rolled, 43.10 cents per lb.
2⅝" to 3½" " " 8ths

⅜" to ¾", 98% rolled and drawn.....48.80 cents per lb.

## BLOCK TIN SHEET AND BRITANNIA METAL

Block Tin Sheet—18" wide or less. No. 26 B. & S. Gauge or thicker. 100 lbs. or more, 10c. over Pig Tin. 50 to 100 lbs., 15c. over 25 to 50 lbs., 17c. over, less than 25 lbs., 25c. over.

No. 1 Britannia—18" wide or less. No. 26 B. & S. Gauge or thicker, 500 lbs. or over at N. Y. tin price, 100 lbs. or more, 5c. over Pig Tin. 50 to 100 lbs., 12c. over, 25 to 50 lbs., 15c. over, less than 25 lbs., 25c. over.

Above prices f. o. b. mill.

Prices on wider or thinner metal on request.

## LEAD FOIL

Base price—figured on base price of lead.

## PLATERS' METALS

Platers' metal, so called, is very thin metal not made by the larger mills and for which prices are quoted on application to the manufacturer.

## SILVER SHEET

Rolled silver anodes .999 fine are quoted at from $1.33 to $1.36 per Troy ounce, depending upon quantity.

Rolled sterling silver, $1.26 to $1.30.

## NICKEL ANODES

| | | |
|---|---|---|
| 85 to 87% purity | .55c. | per lb. |
| 90 to 92% " | .57½c. | per lb. |
| 95 to 97% " | .60c. | per lb. |

# Supply Prices, December 8, 1919

## CHEMICALS

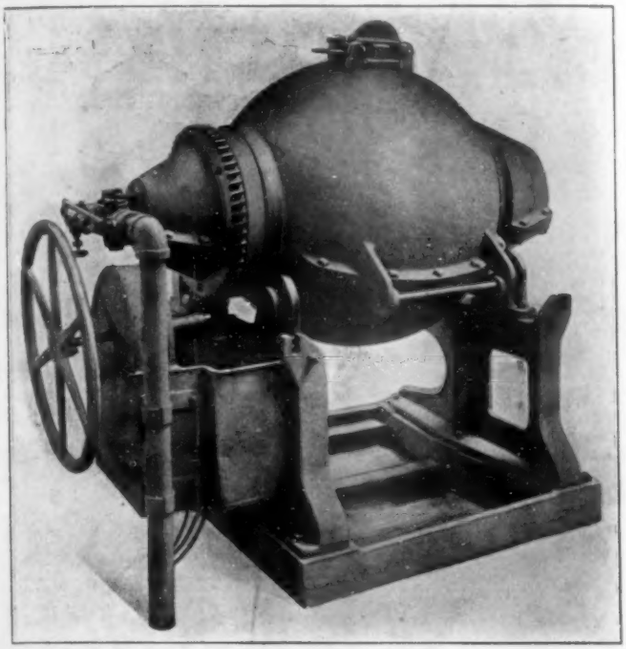
| | | |
|---|---|---|
| Acid— | | |
| Boric (Boracic) Crystals | lb. | .25 |
| Hydrochloric (Muriatic) Com., 18 deg. | lb. | .08 |
| Hydrochloric, C. P., 22 deg. | lb. | .16 |
| Hydrofluoric, 30% | lb. | .40 |
| Nitric, 36 deg. | lb. | 7.28 |
| Nitric, 42 deg. | lb. | 7.90 |
| Sulphuric, 66 deg. | lb. | .06 |
| Alcohol— | | |
| Denatured | gal. | .80 |
| Alum— | | |
| Lump | lb. | .10 |
| Powdered | lb. | .05½ |
| Aluminum sulphate, iron free | lb. | .15 |
| Aluminum chloride solution | lb. | .16 |
| Ammonium— | | |
| Sulphate, tech. | lb. | .10 |
| Sulphocyanide | lb. | — |
| Arsenic, white | lb. | .25 |
| Argols, white, see Cream of Tartar | lb. | .80 |
| Asphaltum | lb. | .35 |
| Benzol, pure | gal. | .55 |
| Blue Vitriol, see Copper Sulphate. | | |
| Borax Crystals (Sodium Biborate) | lb. | .16 |
| Calcium Carbonate (Precipitated Chalk) | lb. | .15 |
| Carbon Bisulphide | lb. | .20 |
| Chrome Green | lb. | — |
| Cobalt Chloride | lb. | 2.00 |
| Copper— | | |
| Acetate (Verdigris) | lb. | — |
| Carbonate | lb. | .40 |
| Cyanide | lb. | 1.00 |
| Sulphate | lb. | .15 |
| Copperas (Iron Sulphate) | lb. | .06 |
| Corrosive Sublimate, see Mercury Bichloride. | | |
| Cream of Tartar, Crystals (Potassium bitartrate) | lb. | .80 |
| Crocus | lb. | 15 |
| Dextrin | lb. | .25 |
| Emery Flour | lb. | .10 |
| Flint, powdered | ton | — |
| Fluor-spar (Calcic fluoride) | ton | — |
| Fusel Oil | gal. | 5.00 |
| Gold Chloride | oz. | 14.00 |
| Gum— | | |
| Sandarac | lb. | — |
| Shellac | lb. | — |
| Iron Sulphate, see Copperas | lb. | .08 |
| Lead Acetate (Sugar of Lead) | lb. | — |
| Yellow Oxide (Litharge) | lb. | .20 |
| Mercury Bichloride (Corrosive Sublimate) | lb. | 1.92 |
| Nickel— | | |
| Carbonate Dry | lb. | .80 |
| Chloride | lb. | .65 |
| Salts, single bbl. | lb. | .16 |
| Salts, double bbl. | lb. | .14 |
| Paraffin | lb. | .20 |
| Phosphorus—Duty free, according to quality | | .38-.45 |
| Potash, Caustic (Potassium Hydrate) | lb. | — |
| Lump | lb. | — |
| Potassium Bichromate | lb. | .60 |
| Carbonate, 96-98% | lb. | — |
| Cyanide, 98-99½% | lb. | — |
| Pumice, ground | lb. | .10 |
| Quartz, powdered | ton | — |
| Official | oz. | — |
| Rosin | lb. | .15 |
| Rouge, nickel | lb. | .45 |
| Silver and gold | lb. | .60 |
| Sal Ammoniac (Ammonium Chloride) | lb. | .15 |
| Sal Soda | lb. | .03 |
| Silver Chloride, dry | oz. | 1.00 |
| Cyanide | oz. | 1.25 |
| Nitrate, 100 ounce lots | oz. | .95 |
| Soda Ash, 58% | lb. | .08 |
| Sodium— | | |
| Biborate, see Borax | lb. | .15 |
| Bisulphite | lb. | .15 |
| Cyanide, 96 to 98% | lb. | .40 |
| Hydrate (Caustic Soda) | lb. | .15 |
| Hyposulphite | lb. | .10 |
| Nitrate, tech. | lb. | .12 |
| Phosphate | lb. | .14 |
| Silicate (Water Glass) | lb. | .08 |
| Sulpho Cyanide | lb. | .80 |
| Soot, Calcined | lb. | — |
| Sugar of Lead, see Lead Acetate | lb. | — |
| Sulphur (Brimstone) | lb. | .10 |
| Tin, Chloride | lb. | .65 |
| Tripoli Composition | lb. | .06 |
| Verdigris, see Copper Acetate | lb. | .60 |
| Water Glass, see Sodium Silicate | lb. | .08 |
| Wax— | | |
| Bees, white ref. bleached | lb. | — |
| Yellow | lb. | .60 |
| Whiting | lb. | .05 |
| Zinc, Carbonate | lb. | .30 |
| Chloride | lb. | .35 |
| Cyanide | lb. | .75 |
| Sulphate | lb. | .12 |

## COTTON BUFFS

| | | |
|---|---|---|
| Open buffs, per 100 sections (nominal). | | |
| 12 inch, 20 ply, 64/68, cloth | base, | $84.65 |
| 14 " 20 " 64/68, " | " | 105.25 |
| 12 " 20 " 84/92, " | " | 107.90 |
| 14 " 20 " 84/92, " | " | 145.35 |
| Sewed buffs, per pound. | | |
| Bleached and unbleached | " | .67 |
| Colored | " | .60 |

## FELT WHEELS

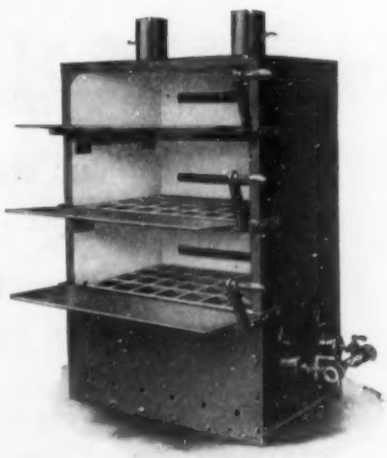
| | | Price Per Lb. |
|---|---|---|
| White Spanish— | | |
| Diameter— 6" to over 16" | Thickness—½" and ¾" | $4.00 |
| " 6" and 8" | " 1" to 3" | 3.35 |
| " 10" to 16" | " 1" to 3" | 3.25 |
| " over 16" | " 1" to 3" | 3.35 |
| " 6" to over 16" | " over 3" | 3.40 |
| Grey Mexican— | | |
| Diameter— 6" to over 16" | Thickness—½" and ¾" | $3.90 |
| " 6" and 8" | " 1" to 3" | 3.25 |
| " 10" to 16" | " 1" to 3" | 3.15 |
| " over 16" | " 1" to 3" | 3.25 |
| " 6" to over 16" | " over 3" | 3.30 |



Monarch Continuous Revolving Non-crucible Metal Melting, Smelting and Refining Furnace

Monarch Steele-Harvey
Crucible Tilting Furnace

Simplex Fig. No. 92 Melting Furnace
Oil or Gas Fuel



Monarch-Arundel Drop Front Core Oven
Gas Fuel

# May the Pleasures of Christmas and of the "Happy New Year" Be Yours

It is up to you, it is according to your disposition. The man that looks at the world today, borrowing trouble, his life will be indefinite; therefore, throw trouble to the winds. Whatever business propositions are present be cheerful, and you win with a smile. Individualism is the champion of today. While we have buffetted for several months against rocks ahead, our view of the business situation is, before the next Presidential Election rolls around, this country will be on the brink of the most prosperous period of its existence, and for dessert the bands will play for the political parties.

We all know who will be the next Presidential nominees, the business interest of the COUNTRY will decide the question.

In the meantime let us have your orders and inquiries for MONARCH lines of BRASS, BRONZE, COPPER, ALUMINUM MELTING FURNACES, CORE OVENS, MOLD DRYERS, LADLE HEATERS, CUPOLA LIGHTERS, ETC., a miscellaneous line of CARBONIZING, HEAT TREATING, TEMPERING, ANNEALING, BARIUM CHLORIDE, SOFT METALS FURNACES. CORE OVENS—Acme, Arundel and Baltimore types; all fuels, all capacities.

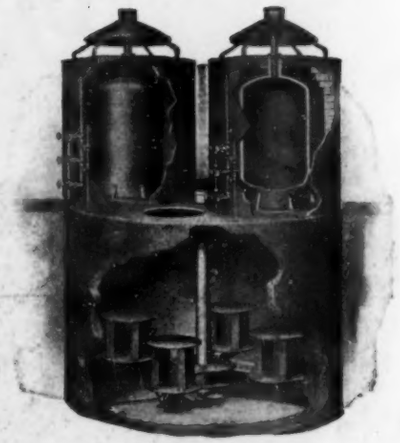
A complete line of MOTOR DRIVEN BLOWERS, FAN AND POSITIVE PRESSURE BLOWERS, PUMPS, OIL AND GAS BURNERS. In fact a complete shop for the equipment of modern foundries.

Catalogue $\frac{\text{TMI-11}}{1919}$

## The Monarch Engineering & Manufacturing Co.

**Office: 1206 American Bldg.** **BALTIMORE, MD.** **Works: Curtis Bay, Md.**

# Gold
# Silver
# Copper
# Brass
# Cupro Nickel
# Nickel Silver



are best annealed in

## KENWORTHY NON-OXIDIZING ANNEALING FURNACES

We have a style for every requirement.

Send for our engineer, let him investigate your needs and quote you.

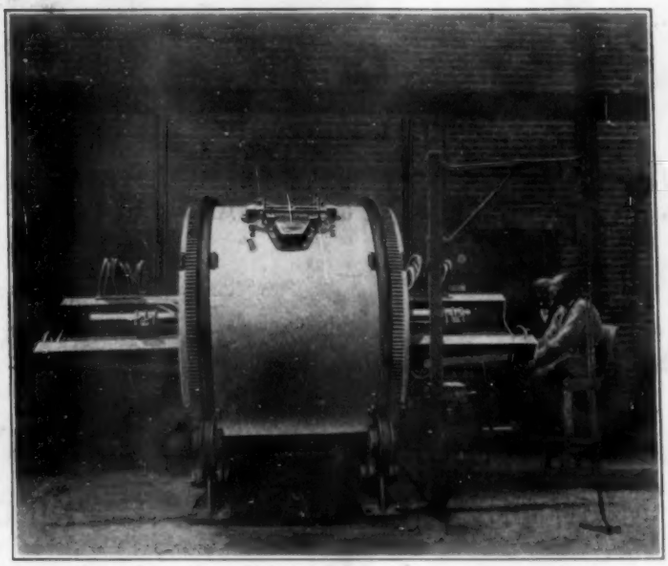
We can deliver better metal than you ever made at less cost than you are now producing.

## Charles F. Kenworthy, Inc.

Waterbury, Conn.

# SERVICE
BACKED BY
# EXPERIENCE

COPPER
BRASS
BRONZE
ALUMINUM



500 Lb.
1,000 Lb.
2,000 Lb.

# DETROIT
ROCKING
# ELECTRIC FURNACES

HAVE BEHIND THEM THE EXPERIENCE AND TECHNICAL SKILL OF AN EXCEPTIONAL ORGANIZATION

The theoretical advantages of the electric furnace are well known, but these advantages can be realized only by the application of technical skill founded on extensive practical experience. Fifty Detroit furnaces, melting a wide variety of metals and alloys, have filled our files with a fund of information which is unequalled in its field. When you submit your problems to us, they receive the attention of engineers who have earned a national reputation through years of experience.

---

DETROIT ELECTRIC FURNACE CO.
642 BOOK BUILDING DETROIT, MICH.

Licensed under U. S. Bureau of Mines Patents

Tilting Crucible with Maxon

Stationary Crucible with Maxon

Tilting Crucible, Oil and Gas Burner

# BUCKEYE

## METAL MELTING FURNACES

CRUCIBLE AND NON CRUCIBLE, USING ALL KINDS OF FUEL

Consultation and Expert Advice Freely at Your Service
Regarding All Furnace and Metal Melting Problems

Send Us Your Specifications

WE ALSO MANUFACTURE

HIGH TEMPERATURE FURNACE CEMENTS.

Maxon Premix Motor Blowers, Fan and Positive Pressure Blowers, Combination Oil and Gas Burners, Oil Pumps, Core Ovens, Etc.

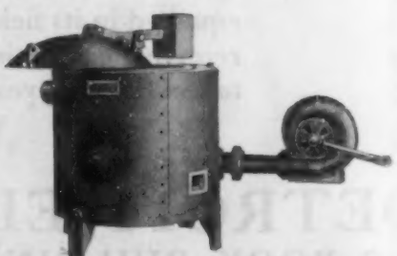
Stationary Crucible, Oil and Gas Burner

## THE BUCKEYE PRODUCTS CO.

Foundry Facings, Core Oils, Supplies, Equipments, Etc.

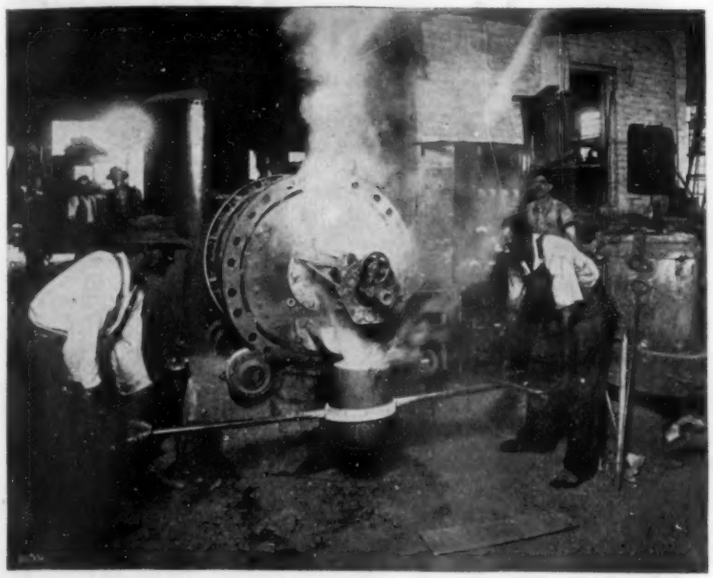
919-929 West Fifth Street Cincinnati, Ohio, U. S. A.

Non-Crucible Oil and Gas Burner with Maxon



Aluminum and White Metal with Maxon

# "IT PAYS TO ROTATE"



Front View—Pouring

## The BOOTH Electric Rotating Brass Furnace

(Patented)

### Makes a Heat in 40 Minutes to an Hour

The simplest, most efficient and economical furnace on the market. Built so that all the lining is washed with metal—resulting in uniform heating. Linings made of ordinary clay brick last indefinitely. Complete rotation produces thorough mixing of the metal, low volatile loss—and low power consumption.

## "IT PAYS TO ROTATE"

Operation of furnace always under absolute control. Labor cost at a minimum. Furnace equipped with or without automatic electrode control. Built in five sizes—250 lbs., 500 lbs., 1,000 lbs., 2,000 lbs., 3,000 lbs.

## THE BOOTH ELECTRIC FURNACE CO.

(Formerly Booth-Hall Co.)

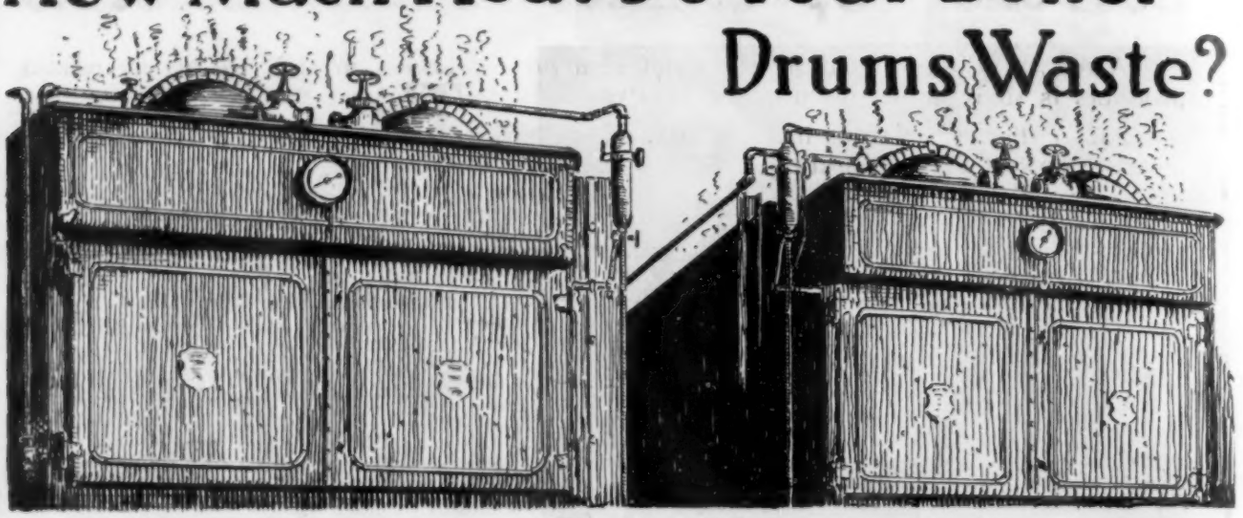
320 SOUTH DEARBORN STREET CHICAGO

EASTERN REPRESENTATIVES:

EDWARD B. STOTT & CO., Flatiron Building New York City

NORTHERN ENGINEERING CO. 308 Chestnut Street Philadelphia, Pa.

# How Much Heat Do Your Boiler Drums Waste?



TESTS made by the Superintendent of a large Pacific Coast power plant shows that the loss of heat through the common brick covering on the drums of a 560 h. p. boiler was equal to 390 barrels of oil per year. Another test, which was run after these same drums had been insulated with one course of

## Nonpareil Insulating Brick

***For Boiler Settings, Furnaces and Ovens***

showed that the Nonpareil Brick reduced the loss to only 144 barrels of oil per year, a saving of 246 barrels—over 63%. The oil cost only 70c. per barrel, but even at that price the saving equalled $172.20 per year for the drums alone. And if the whole setting had been insulated, it would have been many times more.

Results such as these demonstrate clearly the wisdom of using Nonpareil Insulating Brick wherever possible. Their high insulating value (ten times that of fire brick or common brick), their structural strength, their convenient form, and their heat resistance make them the most satisfactory material on the market for the insulation of boiler settings, furnaces, ovens, blast mains, etc. And in nearly all cases the fuel saved will pay for the cost of the insulation in a year or less. Furthermore, by keeping the heat inside where it belongs, much more comfortable conditions will be provided for the men.

***If you would like to know more about Nonpareil Brick and how you could use them in both old and new equipment, ask for the booklets, "Saving Fuel" and "Good Furnaces Made Better." Copies of them together with a large sample of Nonpareil Brick will be cheerfully sent upon request.***

**Armstrong Cork & Insulation Company 116 Twenty-fourth St., Pittsburgh, Pa.**

Also manufacturers of Nonpareil High Pressure Covering for steam lines, feed water heaters, etc.; Nonpareil Cork Covering for drinking water systems; Nonpareil Cork Machinery Isolation for noisy machines, and Linotile for floors in offices, residences, etc.

# Stevens' Specialties Bring Results

After all is said and done the chief element of success in the sale of specialized products is their ability to produce results—economically—and satisfactorily.

All of these specialties have been tried in the crucible of experience and found to measure up to the highest standards.

## Foundry Specialties

The days when Flour, Molasses, and sundry edible things may be used in a Foundry are rapidly passing. Linseed Oil, too, has climbed the golden stair of high prices. The foundryman who thinks in the future must use substitutes or his dream of profits will end in a nightmare of losses. Here are the profit savers:

**DRY BINDERS**

**Stevens' King Kore Kompound,** a black dry powder, but containing two adhesives, one to bind the green cores, so that when cores are not baked promptly the strength of the green core permits handling without injury; another that develops its strength under heat of core oven. **The ideal combination.** It is used successfully when making large heavy Grey Iron cores—sometimes called "chunky" or "blocky"—also for engine beds, machine tools, railway equipment, and cores for steel castings of all descriptions. One Detroit Foundry—a large one—reported a saving of sixteen dollars per day after ceasing old methods and when using King Kore Kompound with Glutrin—not a necessary but a good combination.

**STEVENS' CORE GUM**

Another dry binder but not of black color. A real artist might call it "mouse-tint" but we will call it "gray" in color, but a shiner in effect. It is used for small intricate cores, where Linseed Oil was once thought necessary and with great success. Its greater victories are with the small delicate cores where nothing but pure linseed has been considered before; none of these Compounds are noisy with odor. They are well behaved from start to finish.

**STEVENS' CORE PASTE**

The only substitute for high-grade flour; not the flour that has masqueraded when mixed with plaster, Silica, etc., as flour, but the real hot biscuit raw material. Of course it contains no flour, but you wouldn't know that, so well does it take its place. Here is still a stock of Dextrine, Rosin, and Molasses (New Orleans black strap). The wand of the fairy is liable to touch their prices every day—get in early.

**LIQUID CORE BINDERS**

Stevens' Core Oils wherever used are a synonym for Core qualities; strength, sharp edges, durability, quick baking and quick removal from casting.

## Stevens' Gargara Emery

The superiority of this emery lies in its practical results. It acts as an abrasive, it exercises its cutting qualities, then crushes and polishes. Two services are thus rendered with but one material. Stevens' Gargara Emery gives the results desired. All numbers. In kegs of 350 lbs.

## Buffing Compositions

Some of the things required by stove makers, brass plants and others:

**STEVENS' WHITE ROSE BUFFING COMPOSITION**

For "coloring up" cutlery of all kinds and all light steel castings WHITE ROSE is beyond comparison.

Also for buffing brass or nickel the results obtained are a delight to the eye.

The beauty of nickel or brass is brought out to the greatest advantage. Wherever a brilliant finish is required, it is unexcelled, especially where deep backgrounds are liable to be filled. Particles left in the work are easily washed out.

Put up in airtight hermetically sealed cans. Samples free.

**STEVENS' "ZZZ" COLORING COMPOSITION**

For coloring copper and brass castings, or plated work, such as valves, fittings—spun brass or cast brass—use my "ZZZ" Coloring Composition.

Contains no unsaponifiable material, does not smear the work, gives a lustrous finish, cleans quickly.

It gives to brass the glory of gold.

Equally as good as copper.

Sample for trial free.

**STEVENS' UNION MAID WHITE POLISH**

A superior lime composition for coloring **all kinds** of nickel plated work.

Imparts that beautiful blue-white finish—the looking glass lustre.

Work is economically cleaned—for "UNION MAID" is fine in grain and will easily wash out of deep backgrounds.

Sample on request.

## Buffing Wheels

**Three great values:**

**STEVENS' SPANISH FELT WHEELS**

From the highest grade selected wool, light in weight and superfine in quality. Let me quote prices.

**STEVENS' LIBERTY FELT WHEELS**

Same as Spanish Felts but a trifle coarser wool. But for many uses just as good. Reasonably cheap in price.

**STEVENS' FELT-SUB WHEELS**

Cost half the price of Spanish Felts and wear several times as long. Save glue and emery. Used by stove, automobile and brass manufacturers. One brass manufacturer says the men prefer them to the felt wheel. He has purchased 78 of them in a few months. One automobile manufacturer has bought 500 from me since January first.

Samples of any wheels on order. Give size and number desired.

# Frederic B. Stevens

**Manufacturer Foundry Facings & Supplies, Buffing Compositions & Platers' Supplies**

FACING MILL—Cor. Isabella Ave. and M. C. R. R.
WAREHOUSE and OFFICE—Cor. Larned and Third Sts.
**DETROIT, MICH.**
BRANCH—Hoosier Supply Co., Indianapolis, Ind.
EXPORT WAREHOUSE—Windsor, Ont.

NEW ENGLAND BRANCH—51 Chestnut St., New Haven, Conn.
Erie, Pa.—3101 Hazel Street

# Hausfeld Ladle and Crucible Heater

HAUSFELD HAUSFELD

MANUFACTURED ONLY BY
**THE HAUSFELD CO.**
GENERAL OFFICES AND WORKS:
HARRISON, OHIO, U. S. A.

# "IMPROVED" Tank Furnaces

GAS HEATED

**give instant service for lye and hot water baths.**

Send for Bulletin No. 591-K.

**The Improved Appliance Co.** 410 Kent Ave. Brooklyn, N. Y.

"IMPROVED" MEANS MADE BETTER

Pacific Coast Representative:
C. B. Babcock, 768 Mission St., San Francisco, Cal.

# "Ideal" Tilting Crucible Furnace

**For Melting Iron, Copper, Brass, Bronze, Aluminum, Etc.**

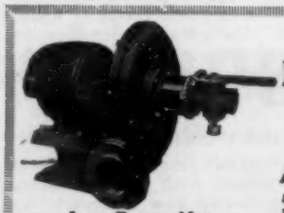
Also a Complete Line of Gas and Oil Fired Furnaces, including Rotary Melting Furnaces with capacity from 250 lbs. to 4,000 lbs.

Also Annealing, Rivet-Heating, Heat Treating, Forge Furnaces, Lead Pot Furnaces, etc.

WRITE FOR CATALOG

**IDEAL FURNACE CO., Chester, Penna.**

Phone Bell 1219



Low Power Motor
Constant Speed

# THE MAXON-PREMIX BURNER

Applied to Industrial Furnaces

**A Mechanical Mixer of Air and Gas in Correct Proportions For Complete Combustion.**

**Power Plant—Air Plant—Mixing Plant and Fuel Burner, All in One Unit**

*We Burn Oil Too*

Write

**THE MAXON-PREMIX BURNER CO.**
MUNCIE, INDIANA

## BOUND VOLUMES
*OF*
## THE METAL INDUSTRY
## FOR 1918

**PRICE, $2.50**

Neatly bound in cloth and carefully indexed.

Special Offer: A year's subscription to The Metal Industry and a Bound Volume for $3.00

*Bound Volumes for 1919 will be ready February 1st*

**THE METAL INDUSTRY,**
99 JOHN STREET, NEW YORK

# PAXSON PRODUCTS

MANUFACTURERS & PRODUCERS

## EQUIPMENT

BRASS FURNACES
CORE OVENS
SPRUE CUTTERS
MOLDERS' TUBS
TUMBLING BARRELS
SAND BLAST
DUST COLLECTORS
MAGNETIC SEPARATORS
CORE MACHINES
DRYING STOVES
BAND SAWS
ASHES GRINDERS

Fig. 70

## SUPPLIES

TONGS AND SHANKS
FLASKS AND CLAMPS
SPILL TROUGHS
INGOT MOLDS
RIDDLES, BELLOWS
SHOVELS, BRUSHES
MOLDING SANDS
CORE SANDS
PAXSON'S PARTING
FACINGS, CHARCOAL
CORE COMPOUND
ROSIN, OIL, FLOUR

WE MAKE IT
PAXSON MAGNETIC SEPARATOR

**J. W. PAXSON CO., Philadelphia, Pa.,** PROVIDENCE, R. I.
BALTIMORE, MD.

# PITTSBURG ELECTRIC BRASS FURNACES

Ferro Alloy, Calcium Carbide and Electric Smelting Furnaces and Plants

PITTSBURG ELECTRIC FURNACE CORP.
PITTSBURG, PA.

The U. S. Smelting Furnace

No Crucibles — No Coke or ashes — No Burnt Metal — No Troubles.

MELT—PURIFY—REFINE

The U. S. Rotary Furnace melts ingots, grindings, borings, turnings—yellow and red brass, copper, aluminum, all non-ferrous metals, in less time and with remarkably low cost. Proven superior to others.

ROTARY MELTING CHAMBER

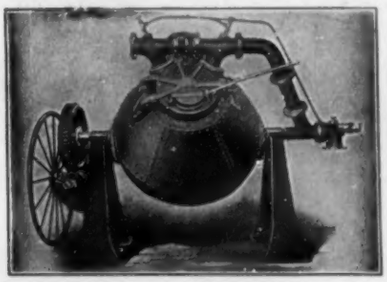
The Melting Chamber rotates—churns the bath—heats metal from above and below—shortens melting period—delivers more heats per day. Get our bulletins on Better Melting at Lower Cost.

U. S. SMELTING FURNACE CO.
25 U. S. BLDG., BELLEVILLE, ILL.

More Copper For Shell Bands
is melted in

# HAWLEY-SCHWARTZ FURNACES

than in all other types combined



In these days of high-priced and inefficient crucibles, the Hawley-Schwartz, which

**Requires No Crucibles**

is the one real solution of metal melting problems. Look up some of our installations, then get our quotations.

CATALOG "M" SENT ON REQUEST

HAWLEY DOWN-DRAFT FURNACE CO.
EASTON, PA.

ESSO

**We Solicit the Complete requirements for your Brass, Bronze or Aluminum Foundry— Also Entire New Installations**

OBERMAYER'S GUARANTEED FACINGS AND SUPPLIES

Everything You Need In Your Foundry

Our Stock of Crucibles, Flasks, Shovels, Rammers, Wire Brushes, Sprue Cutters, Riddles, Soft Brushes, Tumbling Barrels, Brass Melting Furnaces, Furnace Linings, etc., is the most complete in the country.

Reduce the metal loss in slag and keep your ladles, furnaces and metals clean with **Rillton Brass Cleaner. Hott-Patch Furnace Cement** outlasts fire clay 20 times, stands a temperature of 3100 degrees and is ideal as a lining as well as for all kinds of repair work where the best refractory material counts.

The Double Success

**Rillton Brass Cleaner**

**Hott-Patch Furnace Cement**

Barrel on Approval if You Wish

# THE S. OBERMAYER CO.

Established 1874

**2835 Smallman St., Pittsburgh** — **18th and Rockwell Sts., Chicago**

Cincinnati St. Louis Milwaukee Detroit Syracuse Toronto Denver Los Angeles

## TILTING REVERBERATORY MELTING FURNACE FOR Non-Ferrous Metals

NO CRUCIBLES are used in this furnace.

It is simple in design, and easy to charge, stir, and pour.

Very low fuel consumption—oil or gas.

500, 1,000 and 2,000-lb. sizes. In actual practice, 500-lb. size made 501 heats without necessity for repairing the lining. Linings in other sizes last equally long.

*Bulletin 36-A gives full particulars.*

Chicago Ellsworth Bldg.

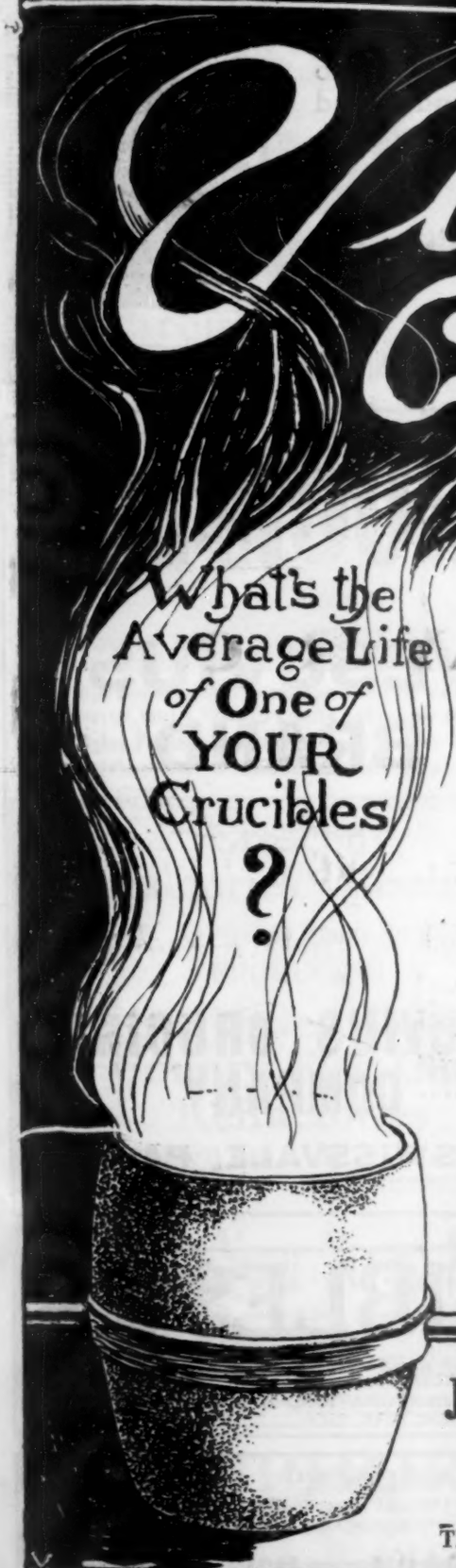
W. S. ROCKWELL CO. INDUSTRIAL FURNACES NEW YORK

Cleveland Guardian Bldg.

Detroit—Majestic Bldg.

**Turn your unused equipment into money by advertising it in THE METAL INDUSTRY**

# Victory Crucibles




## What Is the Average Life of Your Crucibles?

Have you ever had as many as 119 heats from any one crucible—or even 72, for that matter?

## B-42 Victory Crucibles

have a remarkable service record, have proved conclusively that it is practicable to produce crucibles from American clays which surpass those made from imported clay.

Recent tests conducted in a dozen or more shops—representative of all classes of metal workers—showed an average run of 72 heats from B-42 Victory Crucibles, the highest obtained being 119.

B-42 Victory Crucibles—for all classes of work—are made from the best Foliated Ceylon Graphite bonded with American clays specially treated by the new

## Lawton Process

which assures long life and a corresponding reduction in foundry costs. Complete description in our new catalog together with a number of useful formulae and practical suggestions for the busy foundryman—but, after all, a trial order is the most convincing proof.

Ask our customers!

## Jonathan Bartley Crucible Company

**Trenton, N. J.**

Pacific Coast Representative

THE MERRILL CO., 125 Second Street, San Francisco

Forty years devoted exclusively to the making of crucibles and allied products. Send us your next order. Other orders will follow. Write for prices.

**McCullough-Dalzell Crucible Co.**
PITTSBURGH, PA.

THE STANDARD IN CRUCIBLES
FOR
OVER 60 YEARS

J. H. GAUTIER & CO.
JERSEY CITY, N. J.

CRUCIBLES
VESUVIUS BRAND

VESUVIUS CRUCIBLE COMPANY
SWISSVALE, PA.

FRENCH CRUCIBLES
GIVING 43, 50, 55 and 65 HEATS
Large N. Y. Stock AMERICAN Shapes and Sizes.
FOREIGN CRUCIBLES CORPORATION, LTD.
46 CHURCH ST., NEW YORK CITY.

Scientifically Designed
Uniform Temperature
Substantially Constructed

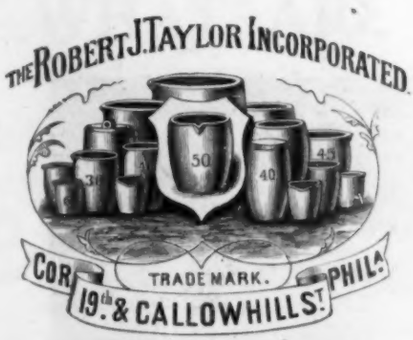
GAS—INDUSTRIAL FURNACES—OIL
These and many other features are what Surface Combustion Furnaces offer. Advise us as to your requirements, and we will submit specifications and prices.

Industrial Furnace Engineers and Manufacturers

THE SURFACE COMBUSTION CO.
PHILADELPHIA PITTSBURG CHICAGO

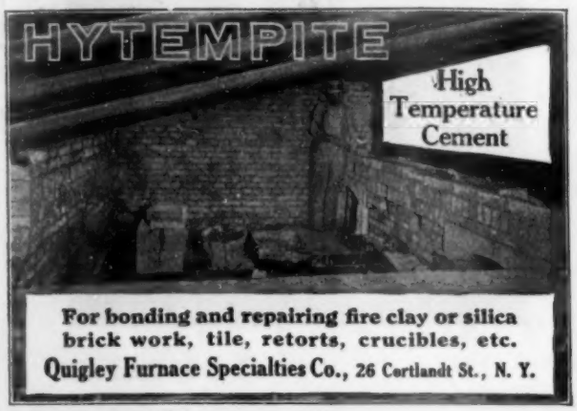
General Offices and Works
366-368 Gerard Ave., Bronx,
New York City, N. Y.

Maximum Output
One-Valve Control
Minimum Fuel Cost




# CRUCIBLES

ROBERT J. TAYLOR
Incorporated
1900 to 1916 Callowhill St., PHILADELPHIA, PA.




**For bonding and repairing fire clay or silica brick work, tile, retorts, crucibles, etc.**
**Quigley Furnace Specialties Co.,** 26 Cortlandt St., N. Y.

# "HOTERNHEL" CEMENT

...FOR...

**Furnaces and Boilers**

METALLURGICAL AND CHEMICAL REQUIREMENTS SATISFIED

GUARANTEED TO OUTLAST THE PARTS BOUND TOGETHER

**ORDER AT ONCE—IN** { CASKS / BARRELS / CARLOADS

Satisfaction Guaranteed—Quick Shipments

"Not a cement of the ordinary kind"

**For Foundry Melting Furnaces, Ladle Heaters, Mold Dryers, Cupola Ladles, Patching Crucibles, Lining Boilers.**

Used when ordinarily, bricks are ready to be discarded

MANUFACTURED BY

**THE AMERICAN ALLOYS CO.**
SOUTH & BALTIMORE STREETS
**BALTIMORE, MD., U. S. A.**

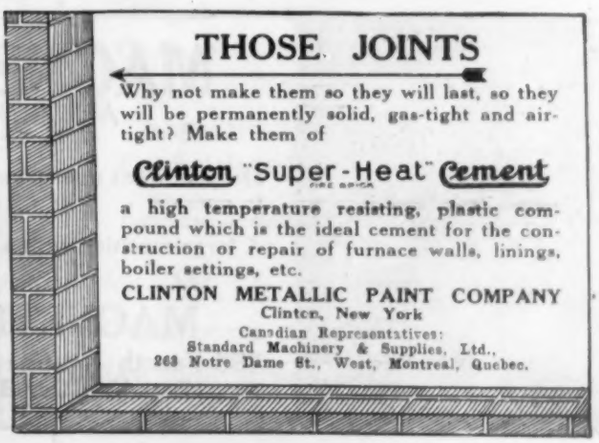
*P. S.—Send orders by wire at our expense.*

## Crescent Refractories Company

Three Plants
PRODUCING
**High Grade Clearfield County Fire Clay Refractories**
CURWENSVILLE - - PENNA.

# Briquette Your Scrap Metals

**The Ronay Process saves labor, metal, time and fuel.**
Send for Bulletins "I."
GENERAL BRIQUETTING CO.,
25 Broad St., New York



## THOSE JOINTS

Why not make them so they will last, so they will be permanently solid, gas-tight and air-tight? Make them of

**Clinton "Super-Heat" Cement**

a high temperature resisting, plastic compound which is the ideal cement for the construction or repair of furnace walls, linings, boiler settings, etc.

CLINTON METALLIC PAINT COMPANY
Clinton, New York
Canadian Representatives:
Standard Machinery & Supplies, Ltd.,
263 Notre Dame St., West, Montreal, Quebec.

# PHOSPHORUS

For Phosphor-Bronze, Copper, Tin, Etc.

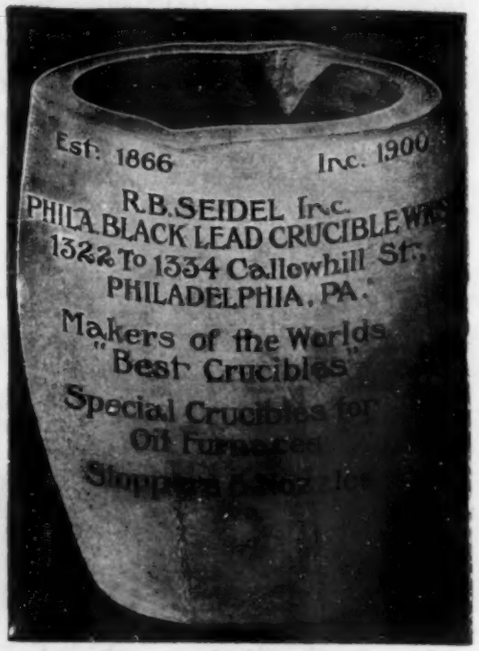
**GENERAL CHEMICAL CO.** 1421 Chestnut Street PHILADELPHIA, PA.

DIXON'S

Crucibles

When you need crucibles there's every reason why you should specify Dixon's Crucibles. They are recognized all over the world as the standard of quality and reliability. An unsurpassed record of nearly a century of satisfactory service is back of them. Booklet 12-A will give you the details. Ask for it.

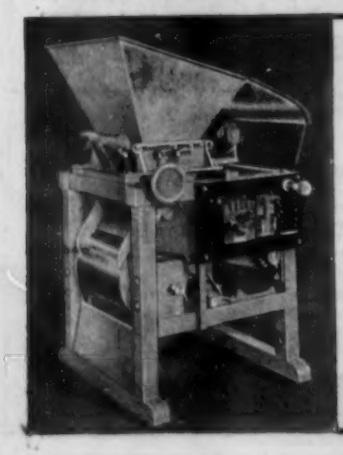
Made in JERSEY CITY, N. J., by the
**Joseph Dixon Crucible Company**
Established 1827




Backed by Twenty Years
Manufacturing Experience

BAY STATE CRUCIBLES RETORTS

SALES OFFICE
**WARREN PRODUCTS CO.**
296 BROADWAY, NEW YORK
Works: Taunton, Mass.



# MAGNETIC SEPARATORS
ALTERNATING AND DIRECT CURRENT

THINK IT OVER

Do you want a small machine with a large capacity, no adjustments, simple to operate

OR

A large machine with a small capacity, many adjustments, difficult to operate.

WHICH?

**MAGNETIC MANUFACTURING CO.**
755 Fourth Avenue Milwaukee, Wis.
Post Van Der Burg Co., New York, Export Representatives

# WHAT ARE *YOUR* COMPLICATIONS?

Proper organization for utmost success demands always that factor offering greatest complication be immediately recognized and corrected through concentration.

## Has That Factor Been Recognized in Your Business?

**1st** Is it that your organization does not function *smoothly* and *harmoniously?*

**2nd** Is it that you do not know what your production *should be* as compared with *what it is?*

**3rd** Is it that your productive effort is not *controlled* and *visualized* so as to secure maximum results?

**4th** Is it that your cost records are not complete, accurate and prompt or that they do not serve *all* three functions, financial, sales and manufacturing as they should?

**5th** Is it that your plant layout processes, facilities or equipment, are not designed and arranged for *greatest results?*

**6th** Is it a lack of co-operation between *workers* and *employer* in your company?

## What Is It?

If you *do not* know what it is let us show you how our industrial survey finds it.
If you *do* know what it is let us tell you about our plan of service which brings to you a programme for immediate, definite, effective and positive correction.
A word will bring us to your office by mail or in person.

*"Knoeppel Organized Service"*

C. E. KNOEPPEL & COMPANY, INC.
Six East 39th St. *Industrial Engineers* New York

MAGNESIUM

## SERVICE

The properties added to Aluminum by the addition of Magnesium constitute a real service, to yourselves and your customers.

Our booklet will interest you, but an order will convince you.

Shawinigan Electro-Metals Co., Ltd.
1500 Westminster Bldg.
Chicago, Ill.

## "Earning-Power" OF Industrial Enterprises Developed and Increased

Production speeded.
Output enlarged.
Costs reduced.
Organizations strengthened.
Co-operation of workers secured.
Capital Investment lessened.

**Consultation without obligation or charge**

## W. L. Churchill

INDUSTRIAL ENGINEERING SERVICE
6 East 39th Street NEW YORK

# DINGS TYPE M MAGNETIC SEPARATORS

FOR
ALUMINUM AND
BRASS BORINGS
AND TURNINGS
AND
101 OTHER PROBLEMS

## DINGS MAGNETIC SEPARATOR CO.

677 SMITH ST. MILWAUKEE, WIS.

# MAGNESIUM

99% PURE IN BARS—POWDER—ALLOYS

**The lightest commercial metal—one-third lighter than aluminum. A powerful deoxidizer for aluminum, copper, brass and other non-ferrous metals.**

## AMERICAN MAGNESIUM CORPORATION

NIAGARA FALLS, N. Y.

Works { Niagara Falls, N. Y.
Rumford, Maine

NORTHERN CRANES

ELECTRIC HOISTS
AIR HOISTS

Get NORTHERN prices and Catalogs when you need Cranes or Hoists. AC, DC or Hand.

NORTHERN ENGINEERING WORKS. DETROIT, MICH.

**Mg** 99% Pure Metallic Magnesium

THE NORTON LABORATORIES, Inc.

41st and Madison Ave., New York Lockport, N. Y., Nashua, N. H.
British Thermit Co., Ltd., 49 and 51 The Albany, Liverpool, England
Authorized Representative in British Isles

**Mg** 99.8% Pure Metallic Magnesium Sticks

J. HARTOGENSIS

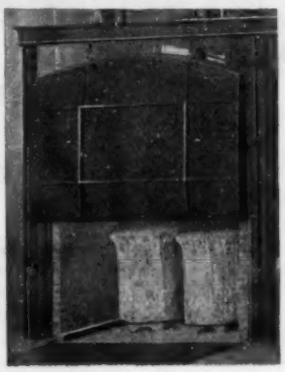
ROTTERDAM, (Holland)

There are Many Years of Faithful Service behind

# Pecora Heatpruf Plastic Cement

## The Reliable and Economical Bonding Material

For new fire brick and tile construction, furnace linings, furnace door linings, boiler settings, arches and bridge walls, pit furnace walls, gas retorts, kilns, and for



### All Kinds of Repair Work

where a tremendously refractory material is essential.

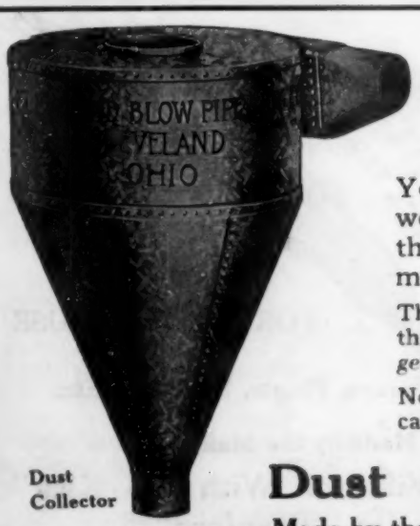
You will find "a hundred and one" places around your plant where Pecora Heatpruf will save you money. Line ladles and crucibles with a wash of Pecora Heatpruf; plug up cracks, strengthen thin walls; use for rammed-up linings, etc. Sets by air or heat.

Send for a barrel and try it out.

**Prompt Shipment—Write, wire or phone your order**

## PECORA PAINT COMPANY

**4th and Erie Ave.** ESTABLISHED 1862 BY SMITH BOWEN, INC., 1911 **Philadelphia, Pa.**




**Dust Collector**

# They Catch Dust and Hide It Away

You know the injurious effects of factory dust on both workers and machinery. Gritting, grinding, cutting, those minute stony particles work their way into the most inaccessible nooks and corners everywhere.

The one method of fighting dust is to catch it where released to the air and hide it away in specially made collectors *where it can't get out.*

No matter what the particular adaptations of your machines, you can fight successfully by installing e

## Dust Collecting Systems

**Made by the Cleveland Blow Pipe & Mfg. Company**

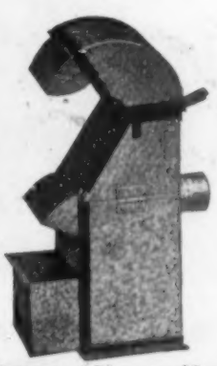
There is a Cleveland Blow Pipe System for every conceivable requirement. This has been proven by the hundreds of installations now meeting all manner of peculiar conditions in varied plants, both large and small.

That you may learn the truth about fighting dust and its true importance, ask us to give you facts established by Cleveland Blow Pipe Equipment while battling dust for others. The satisfaction to which they testify indicates the possibilities of adequate *Dust Collecting Systems* installed for you. Write to us. Of course, you will assume no obligation by so doing.

**Exhaust Fan**

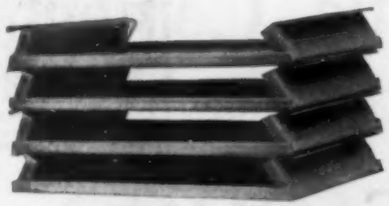
## CLEVELAND BLOW PIPE & MFG. CO.

**6950 Kinsman Rd., Cleveland, Ohio**

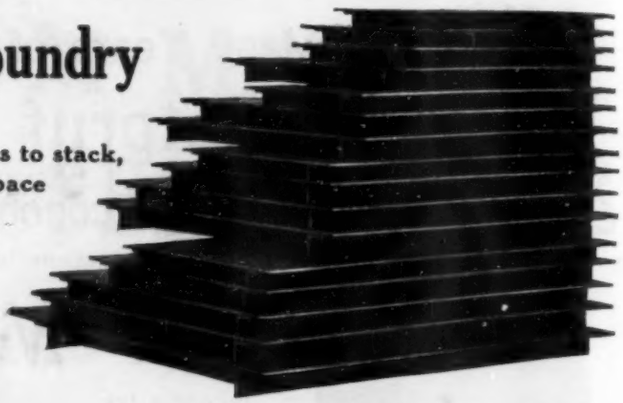


**Improved Vacuum Hood**

# Core Trays For The Foundry



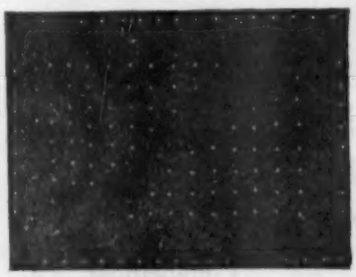
Made so as to stack, utilizing space in the core oven

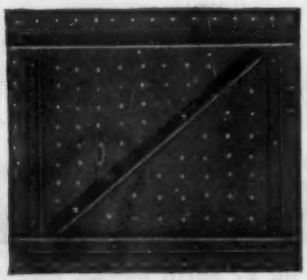


Strongly made from sheet steel. Reinforced on sides with two folds of the sheet turned at right angles to the bottom, giving the tray the necessary stiffness.

Stock sizes 20" x 12" x 2"—3", 4", or higher.
16 or 18 Gauge Steel.

Furnished with reinforced angle iron on bottom and perforated when specified. Special sizes to order.





**"NEVER BREAK" ALL STEEL CORE TRAYS**
For the prevention of crooked cores

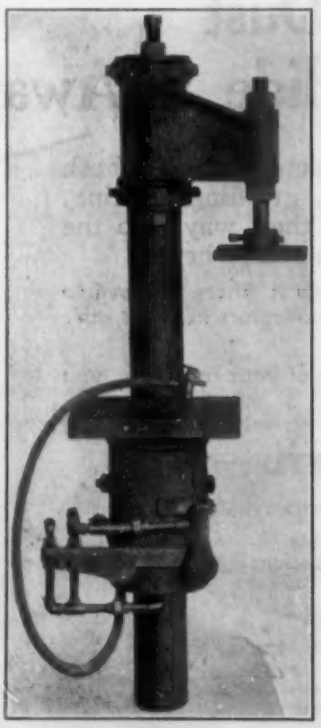
**"NEVER BREAK" ALL STEEL BOTTOM PLATES**
For the prevention of Burnt Bottom Boards

They are reinforced, unbreakable, absolutely straight, cheaper than cast iron and only one-third the weight.

30 STANDARD SIZES OF EACH CARRIED IN STOCK.
SPECIAL SIZES TO ORDER.

Send for "Never Break" Circular

THE WADSWORTH CORE MACHINE & EQUIPMENT CO.
AKRON, OHIO



# Molding Machines

POWER AND HAND OPERATED

# Stationary, Portable AND Post Types

Send for Descriptive Folder "B" and Prices

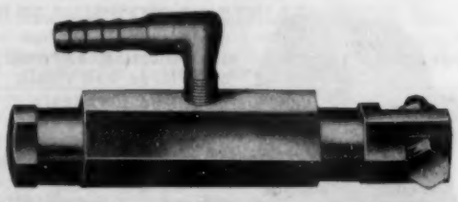
B. & B. MANUFACTURING COMPANY
INDIANAPOLIS, IND.

THE BRANFORD SPRAYER PRICE $3.00

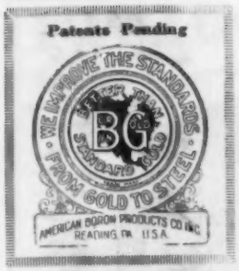
FOR FOUNDRY USE

Also Sprays, Paints, Lacquers, Etc.

Made by the Makers of
"The Vibrator With the Kick"
the "Branford"



MALLEABLE IRON FITTINGS CO.
BRANFORD, CONN., U. S. A.



FOR ALLOYING, DEOXIDIZING AND SOLID-CASTING ALL METALS
ALL METAL BORONIC PRODUCTS IN SHOT FORM
MADE IN AMERICA
FOR ALL THE WORLD

# WE MUST MAKE GOOD

## It Is Our Business *To Make Good*

## It Is Your Business To See That We Do *Make Good*

THE TIME IS HERE when deception, hypocrisy and sham are "getting what belongs to them"; when the veil of FALSE PRETENSE, CAMOUFLAGE and MAKE-BELIEVE is to be torn from the STATUE OF WORLD-LIBERTY and when THE ANNOUNCEMENTS AND PROPHECY OF CENTURIES PAST ARE BEING FULFILLED; "WHEN THE OLD SHALL PASS AWAY AND ALL THINGS BECOME NEW."

The BABEL OF WORLD CONDITIONS is but the surest evidence of the GREAT TRANSITION taking place in the spiritual, social and business world and the imminent arrival of THE NEW ERA.

To the student of past and present CONDITIONS it is easy to note the fulfillment of THE PROMISES and PROPHECY. To the inheritors of the NEW EARTH with all its transformation from the old, there are marvelous things within view. They already are preparing to give the NEW LIFE a long welcome, and they are throwing off the PAST, understanding the PRESENT and planning for a LONG FUTURE of enjoyment of what is theirs by the law of RIGHT and SERVICES RENDERED.

However much we might be criticized for stating frankly and truthfully what we are about to say, we say it without fear or favor, that IF MEN WERE HONEST AND TRUE TO THEMSELVES AND BETWEEN THEMSELVES—employer as well as employe—and IF THEY KNEW THEMSELVES AND DEALT BY ONE ANOTHER AS THEY SHOULD, WE'D NOT NEED TO SELL THEM A SINGLE NUMBER OF OUR PRODUCTS, for we are convinced that if THE GOLDEN RULE is studied and applied, it will be found that INTEGRITY, INTELLIGENCE and SKILL will finally put us out of the business of selling BORONIC NUMBERS FOR METAL AILMENTS.

Until this FUNDAMENTAL TRUTH and FACT is universally understood and APPLIED, we shall SERVE to PRESCRIBE RELIEF whenever we are called upon to do so, IF WE CAN.

We are not of the class of practitioners who promise an infallible cure for all metal ills, without reserve. As just intimated, we know that many ailments (?) are IMAGINARY, that we would be "QUACKS" pure and simple if we practiced in the cures of imagination; so that we wish only to be understood and known as PROFESSIONAL in the sense of supplying RELIEF and a BRIDGE-OVER, and we ask only to be known by the following simple profession:

FIRST—We manufacture and prescribe our BORONIC, ALL-METAL, ALLOYING and DEOXIDIZING NUMBERS—now over twenty-seven numbers—for use in metal melts where trouble is encounterel in obtaining SOLID CASTS, METALS THAT ARE NOT UP TO REQUIREMENTS AND SPECIFICATIONS and WHERE THE SKILL OF THE FOUNDER FAILS TO SERVE TO PRODUCE WHAT IS WANTED.

SECOND—We believe that we can render SERVICE where very many others cannot.

THIRD—We are here TO SERVE FIRST and then to OBTAIN AN HONEST RETURN FOR OUR SERVICE and PRODUCTS. We appreciate the "RETURNS" best where our SERVICE is MOST SUCCESSFULLY RESULTFUL.

Our Price Lists and all information regarding our PRODUCTS, as also our samples, will be found at the SERVICE STATIONS of the Reuben H. Donelly Corporation (located in the large American cities) as advertised in its NATIONAL CLASSIFICATION TELEPHONE DIRECTORIES (distributed everywhere). Quickest information is had through these SERVICE STATIONS.

**Watch future issues for the valuable information we shall soon publish.**

Address all American Inquiries to

**American**
**Boron Products Company, Inc.**
**(Sole Manufacturers)**
**Reading, Penna., U. S. A.**

**Foreign Distributers:**
**EDWARD LE BAS & CO., London, E. C. (3), Eng.**
**NATIONAL ALLOYS, LIMITED, London, Eng.**
**CHINA & JAPAN TRADING CO., LTD., Kobe, Japan**
**CHINA & JAPAN TRADING CO., Shanghai, China**

To the Metal Manufacturer or the Individual Mixer of Metals:

**PLEASE USE THIS COUPON**

American Boron Products Co., Inc., Reading, Pa. M-I 11-1919

Gentlemen:—Kindly send me complete details regarding the many ways whereby I can economize by using Boronic Alloying Metals.

MY HOME ADDRESS IS:

Name .....

City .....

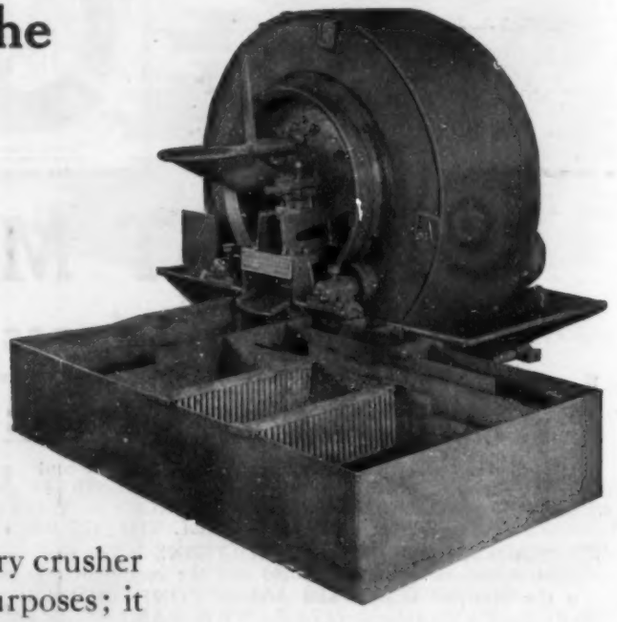
State .....

☞Our literature mailed to employer and employe who aim for IMPROVED PRODUCTS.

# The Sooner You Put the

# STANDARD CRUSHER AND PULVERIZER

**on your "pay roll" the quicker your profits will increase!**



The Standard is not an ordinary crusher re-adapted for brass foundry purposes; it was designed by expert engineers to meet the specific needs of the foundryman.

It works on distinctly different principles from other cinder mills, embodying ideas which eliminate the faulty features conspicuous in the older types of crushers.

The value of these unique improvements has been thoroughly demonstrated in the many foundries and mills where the Standard is in use. In these places the savings in power, labor, water and repairs and the increased amount of metal recovered from the cinder pile soon pay back the cost of the Standard installation.

The Standard { uses the least water<br>requires the least labor<br>needs the fewest repairs<br>recovers the most metal

We show our confidence in the Standard by permitting you to try it out on approval in your own shop.

Why not communicate with our Engineering Department at once?

**Catalog S-C sent on request**

## Standard Equipment Company

**NEW HAVEN, CONN.**

# SLY DUST ARRESTERS

Are a paying investment from the start where dust is collected for its value as a salable product. They get it all and store it for economical handling.

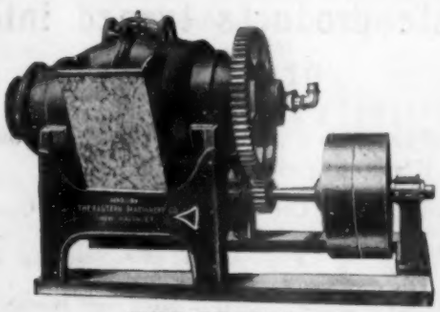
Sly Dust Arresters also effect better working conditions for men and cut down the depreciation of machinery. One installation may accomplish both results. Let Sly Engineers solve your dust collecting problem.

**The W. W. Sly Mfg. Co.**

CLEVELAND

New York Chicago

# HILL IMPROVED CINDER CRUSHER



**WET PROCESS**

## THE BEST PULVERIZER

**The Hill Improved Cinder Crusher** pulverizes and cleans Brass Foundry Cinders, Skimmings, and all materials of similar nature. It does the work in the *surest* and most *economical* way.
Simple in design and easily operated.
Write at once for descriptive circular

**The Eastern Machinery Co.**

NEW HAVEN, CONN.

# Cores that Vent Freely Put an End to Many Losses

Metal and men are often blamed for castings that go wrong; when the real fault is that the cores fail to vent properly.

For gases that form in pouring must escape; and if they can't vent through the pores of the cores they take a quicker way.

**FLINT CORE SAND SILICA**

**Makes free-venting cores with 50% less core oil.**

Because the oil forms a thin, even, film around the smooth, round, clean dry grains of this *dry* sand.

And, when you use our formula (mixing the oil before the water) you get better, stronger cores with half the usual amount of oil.

Send for our Folder, which describes the sand and gives the formula.

**United States Silica Company**

Sole Producers of Flint Silica

1955 Peoples Gas Bldg.

Chicago

## Small Rotary Table Sand-Blast

Efficiency of big equipment for the small shop.

Auxiliary Equipment for the Big Shop.

42" diameter Table, Self-contained Hygienic Sand-Blast.

Cleans Steel, Grey, Malleable, Brass and Aluminum Castings, Stampings, Forgings, Heat Treated Parts, etc.

Small floor space—small Air Consumption and Small Cost.

Ready to operate when attached to air line, uses Sand or Metal Abrasive.

It's a new one in the "PANGBORN" Line that embraces

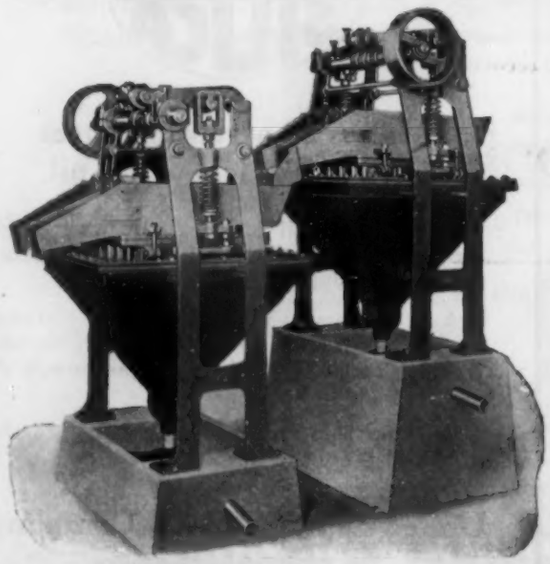
**"A Type and Size for Every Requirement."**

PANGBORN CORPORATION
HAGERSTOWN, MD.
SAND-BLAST SPECIALISTS

P. O. Box 854

# METAL RECLAIMING EQUIPMENT

## FOR THE TREATMENT OF FOUNDRY RESIDUE



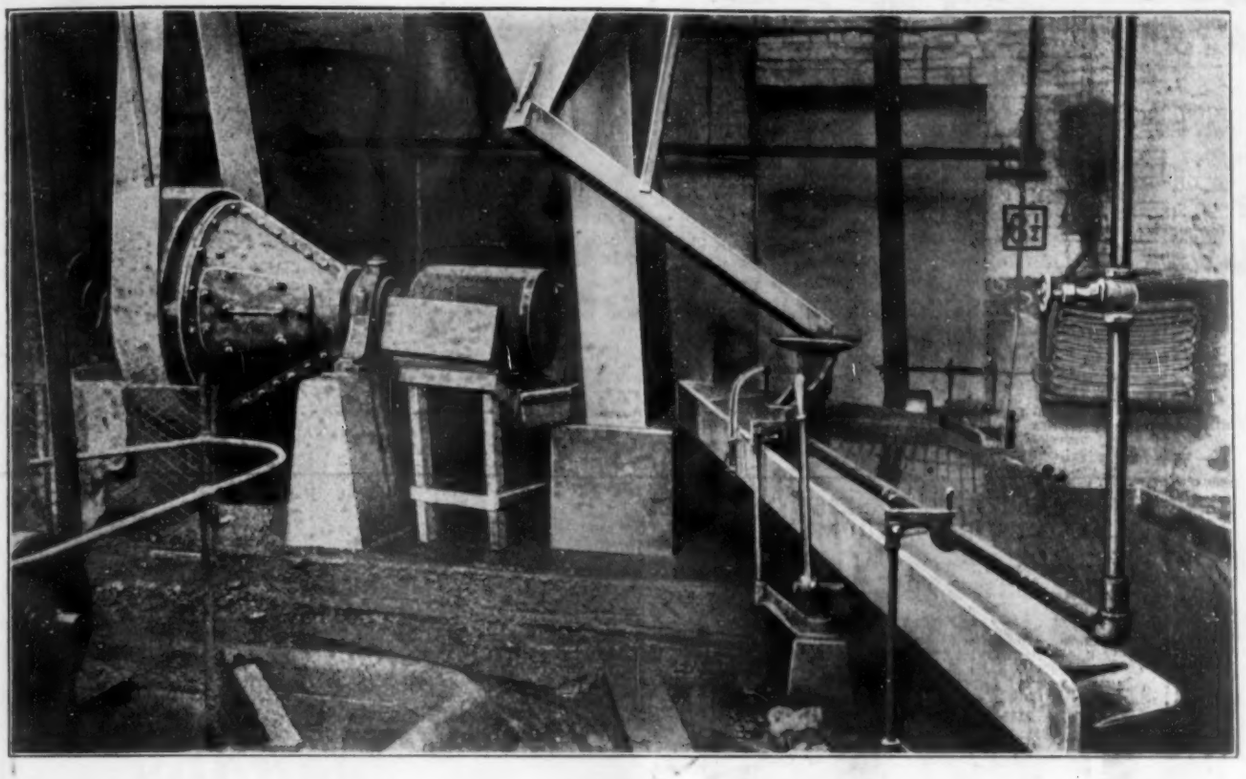
### Waste products turned into profits!

The following is a partial list of users of our Metal Reclaiming equipment:

American Hardware Corporation
Ajax Metal Co.
White & Bro.
Scovill Mfg. Co.
Chase Metal Works
Seymour Mfg. Co.
Bridgeport Brass Co.
Bristol Brass Co.
Tottenville Copper Co.
Lumen Bearing Co.
Plume & Atwood Mfg. Co.
Empire Metal & Refining Co.
The Lunkenheimer Co.
Neptune Meter Co.
Lake Erie Smelting & Refining Co.
J. L. Mott Iron Works
Baltimore Tube Co.
Baltimore Copper, Brass & Rolling Co.
Connecticut Metal & Chemical Corp.

JIGS, SCREENS, SAND AND SLIME TABLES, CLASSIFIERS, AUTOMATIC ORE FEEDERS, etc. } Manufactured by { JAMES ORE CONCENTRATOR CO.
35 RUNYON STREET, NEWARK, N. J.

JAMES CONCENTRATING MACHINERY



# A Typical Installation

for

# Saving Metal in Cinder, Slag, Mattes, etc.

If your foundry waste contains value in brass, aluminum, copper, lead, etc., an installation such as above will save you money in reclaimed metals.

If your present equipment does NOT recover ALL your metal and is costly or dusty to operate

# Hardinge Conical Mills

will solve your problem.

The Hardinge Mill will crush your waste so fine that the smallest particle of metal is reclaimed.

It grinds wet or dry and when running dry is dustless in operation.

The Industrial Section of our Catalog Number 7 will tell you more. Ask for Section Six.

# Hardinge Conical Mill Co.

120 Broadway, New York

| Salt Lake City | Denver | SPOKANE | LONDON |
|---|---|---|---|
| Newhouse Building | First Nat'l B'k. Bldg. | Old Nat'l Bank Bldg | Salisbury House |

Cable Address: "Halharding, New York"

# RICH
## FOUNDRY EQUIPMENT

You should know exactly what RICH equipment is doing for others and can do for you. Statements from the unbiased users regarding the services of our products in their plant, are usually more convincing and less liable to exaggeration than our statements would be.

We earnestly invite you to make inquiries of the users named here regarding the actual work rendered by our equipment in their plants.

Although space only permits us to mention a few of our many users, their candid and unbiased statements of facts should greatly influence the prospective purchaser of foundry equipment.

Faunt Bros. Brass Foundry, Chicago, Ill.
Buhl Malleable Co., Detroit, Mich.
Chicago Steel Foundry Co., Chicago, Ill.
Danville Malleable Iron Co., Danville, Ill.
American Bronze Co., Berwyn, Penna.
Belle City Malleable Iron Co., Racine, Wis.

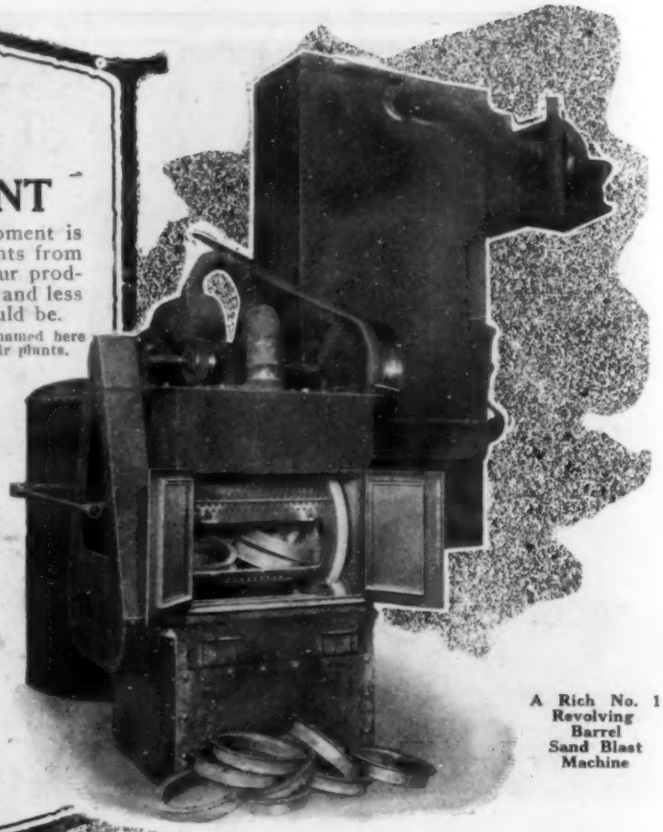
We will gladly give you names of users in your vicinity upon request.

### OUR COMPLETE LIST OF FOUNDRY EQUIPMENT

Revolving Barrel Sandblast Machines
Revolving Table Sandblast Machines
Oven Charging Trucks
Hammer Core Machines
Sandblast Cabinets
Sandblast Rooms
Dust Arresters
Duplex Sand Shakers
Sand Mixing Machines

Built in various sizes to meet all conditions.
Write us for any information and descriptive matter.

**American Foundry Equipment Co.**
50 Vanderbilt Ave., New York.
2516 W. 48th Place, Chicago.
Successors to
The Sand Mixing Machine Co. and
The Rich Foundry Equipment Co.



A Rich No. 1 Revolving Barrel Sand Blast Machine

# SAND BLAST

An efficient means of frosting and mat finishing on metals, glass and other materials; cleaning castings and patterns; stencilling letters and designs, and properly surfacing articles which are to be plated and polished.

Does away with scratch brushing and the use of dangerous acids.

Inexpensive to install, rapid in action and easily understood and operated by anyone.

No matter what line of goods you make there is a use for the sand blast. There is an improvement you can make in the appearance of your goods or in the method of producing the finish. Bottles and containers may be marked with letters and designs—electric light bulbs also—completely or partially frosted a fine silky effect or a very rough frosty appearance. Very simple and easily understood, economical and effective.

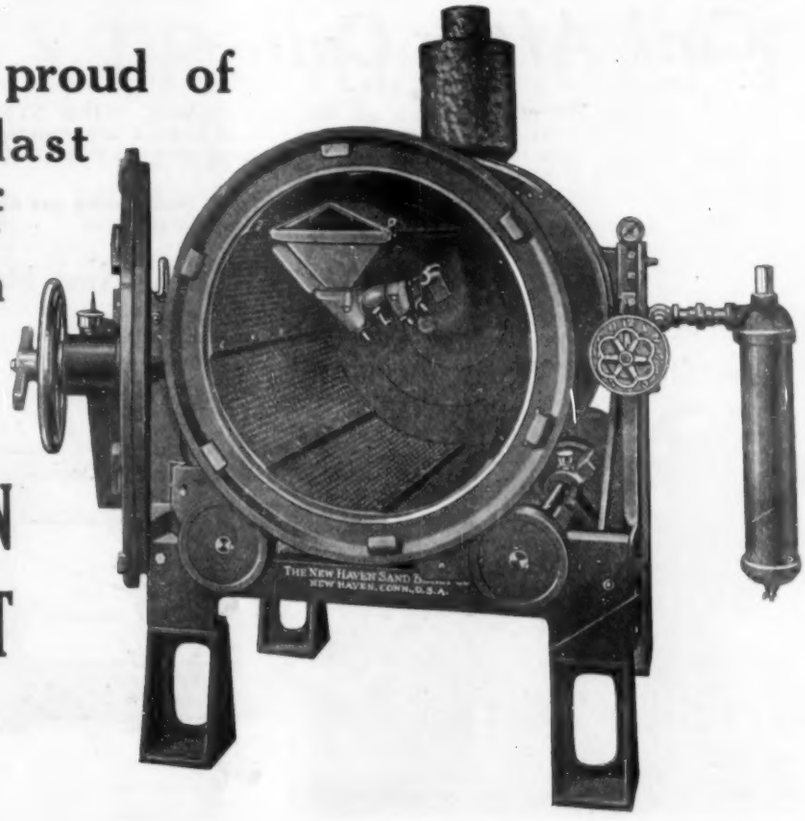
All the dust of the sand blasting operation is confined inside the cabinet. You watch the progress of the work under the nozzle through the front glass.

The most inexperienced person in your shop can operate these sand blasts—Nothing to get out of order, just plain, simple machines that can be understood at a glance. You can't spoil the work by leaving it in the machine too long. You get the same effect every day—always smooth and uniform. Only a very little power required and very little sand—No expense to speak of but a great deal of production. No factory is complete without a sand blast.

## LEIMAN BROS., 62 John St., New York

**You can be proud of your sand blast department if equipped with a**

# NEW HAVEN SAND BLAST BARREL



Your shop will be an up-to-date shop comparing favorably with the very best.

It will be a *clean* shop because the New Haven is dustless being the only sand blast barrel which is truly self-contained, in which the sand does not leave the barrel but is used over and over again until worn out—no dust can escape into the room.

It will be a *productive* shop—the New Haven has large capacity and does quick work. The room will not get cluttered up with unfinished work.

It will be an *economical* shop—economical in first cost, in overhead and in maintenance. The New Haven needs but little attention—labor costs are low and repair and renewal bills are very small.

The New Haven leads the way to profit and satisfaction. Put it into your plant on approval.

**Catalog S-B sent on request**

## New Haven Sand Blast Company

**New Haven, Conn.**

# *Coil After Coil—*

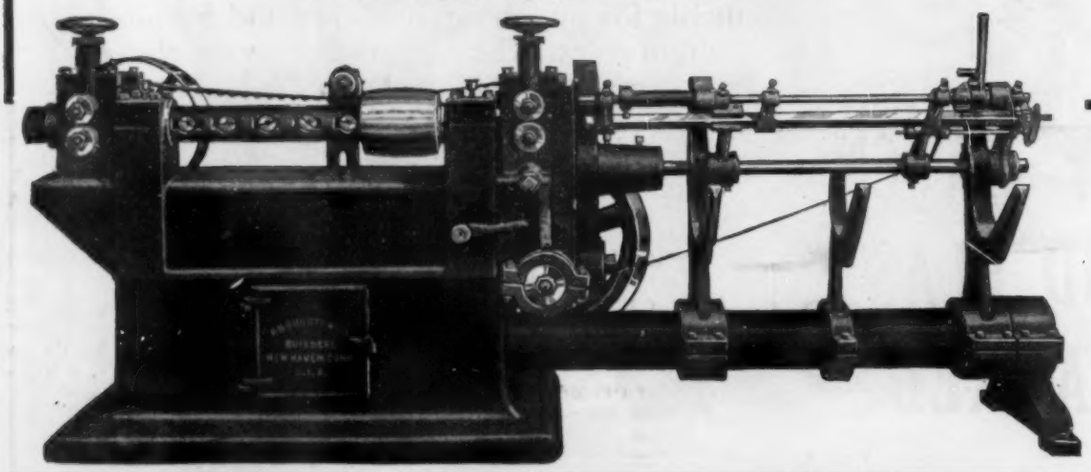
You can pile the work on this AUTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE, coil after coil, 24 hours a day, running at high speed, and it never fails to deliver perfectly straightened wire cut to accurate lengths. Handles all kinds of wire.

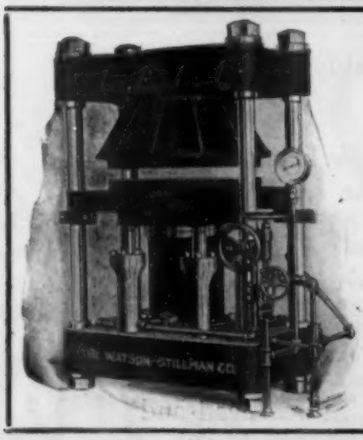
*Half a century spent in specializing in Straightening and Cutting Machinery enables us to offer the BEST*

**THE F. B. SHUSTER CO., New Haven, Conn.**

**Formerly John Adt & Son** *Established* 1866

*Also Makers of Riveting Machines*





# HYDRAULIC PRESSES

**For Die Sinking, Pressing, Embossing, Sheet Metal, Forming, Drawing, Cupping Flanging, Bending and Extruding**

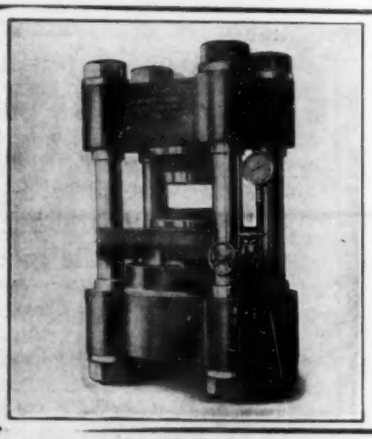
Two of these presses are shown here. One at the right is a 1000 ton standard die press, designed to be used with an independent pump or accumulator system. The other is a press arranged to draw automobile rims from sheet metal. Our line of presses contains many machines built for the working of metals. We build everything necessary to equip complete hydraulic plants—pipe, valves, pumps, accumulators, packing, etc.

**Write for Catalogs**

**The Watson-Stillman Company**

W-S HYDRAULIC **196 Fulton St., New York** **Chicago, McCormick Building** W-S HYDRAULIC

359



## BRASS AND COPPER
## ROLLING MILL MACHINERY

And Special Machinery of Any Description

**THE TORRINGTON MANUFACTURING CO.,**

**Torrington, Conn., U. S. A.**

USE ONLY THE CHAS. K. SCHWEIZER CO.

**MOULDS**

**Waterback and Plain**

620 North 3rd St.
ST. LOUIS, MO.

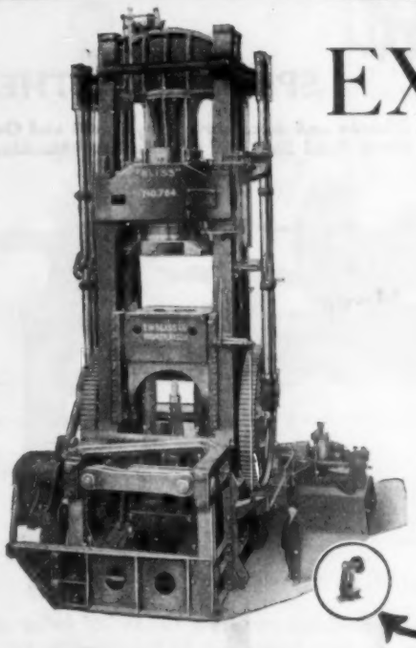
SOLDER, BABBITT, LINOTYPE, TIN AND LEAD MOULDS.

Send your inquiries on special designs.

## J. P. FANNING

**678 Jefferson Ave., Brooklyn, N. Y.**

Original makers of **Molds** for **Solder** and **Babbitt Metals.** We can supply you with a changeable name machine with or without waterback, also Car Seals, Dress Weight and Bullets Machinery.



# EXTREMES MEET

We're showing you the "biggest and the littlest" here side by side just to point to a fact —that every power press need of the sheet metal manufacture is covered by "BLISS" lines. The tiny press in the circle (not so tiny at that for it weighs 250 lbs.) is a Bench Press suitable for punching, blanking and forming light work. The big one that towers above its operator is a **Bottom Slide Toggle Drawing Press No. 764** especially adapted for producing large, heavy, steel barrels, etc.

WE BUILD BOTH THESE PRESSES

BLISS 1857

## E. W. BLISS COMPANY

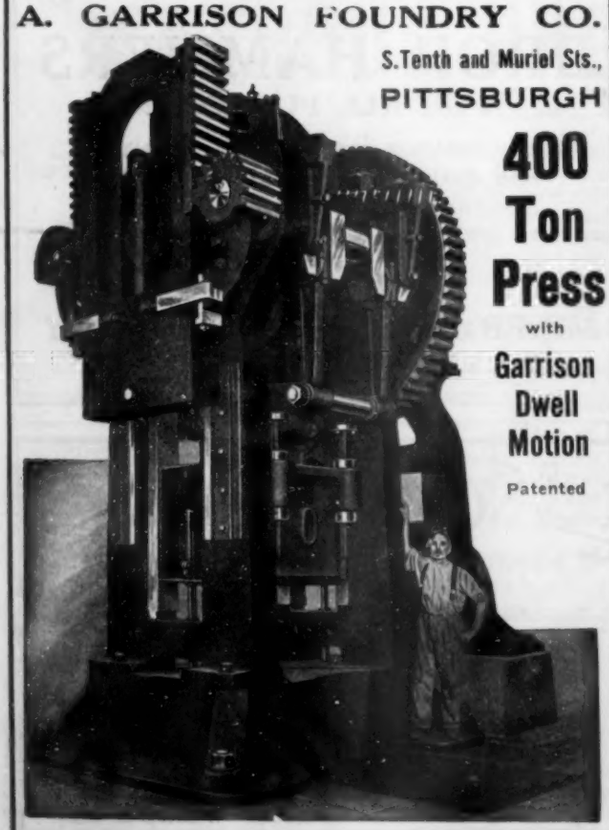
Main Office and Works: BROOKLYN, N. Y., U. S. A.

CHICAGO OFFICE People's Gas Building
DETROIT OFFICE Dime Bank Building
CLEVELAND OFFICE Union Bank Building
LONDON, S. E., ENGLAND, Pocock Street, Blackfriars Road
PARIS, FRANCE, 100 Boulevard Victor-Hugo St. Oeen

BLISS 1919

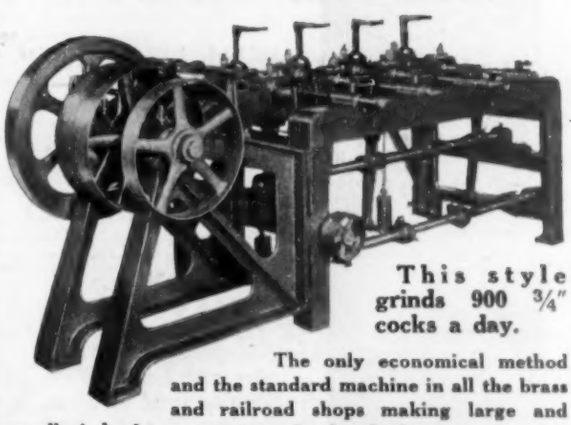
## A. GARRISON FOUNDRY CO.

S. Tenth and Muriel Sts.,
PITTSBURGH



**400 Ton Press** with **Garrison Dwell Motion** Patented

## Turner Automatic Cock Grinder



This style grinds 900 3/4" cocks a day.

The only economical method and the standard machine in all the brass and railroad shops making large and small air-brake, ammonia and other high-pressure cocks.

Send for full particulars. Also Catalog M-2 of our Hand and Power Molding Machines, Sprue Cutters, Sand Sifters

## TURNER MACHINE CO.

3633 No. Lawrence St. Philadelphia, Pa.

**Just a Few of the Many Wire Shapes and Forms We Have Made on Our Automatic Machines**

Our Metal Department has vastly outgrown the making of parts for corset, garter and suspender trade.

It now occupies 60,000 square feet, and has a large surplus capacity for a variety of metal work as by-product. This places us in a most advantageous position, and enables us to make prices which you will find surprisingly low.

Quotations and models furnished promptly on all kinds of blankings stampings, etc.

METAL DEPARTMENT

**The Warner Brothers Company, Inc.**

BRIDGEPORT CONN.

Experts in the Manufacture of Wire Shapes and Forms for the Trade. We Manufacture to order Complete Wire Specialties — Ready for the Market.

**Send Samples or Blueprint for Estimates**

PRYIBIL

**METAL SPINNING LATHES**

**Tools, Chucks and Accessories for Round and Oval Work, Metal Band Saw and Circular Saw Machines**

22 in. Oval Spinning Lathe with Compound Slide Rest

**Sizes of the regular machines run from 15" to 26" swing and the extension or gap type lathes will be furnished in 22" x 44" swing size, and 27" x 60" swing size.**

**P. PRYIBIL MACHINE CO.**

ESTABLISHED 1862

512-14-16-18-20-22-24 West 41st Street NEW YORK

**DROP HAMMERS**

**FOR ALL PURPOSES**

**We make a large variety of sizes and designs, both plain and automatic types, ranging from 30-pound to 5000-pound hammer.**

**Send for Catalogue X**

**MINER & PECK MFG. COMPANY**

**NEW HAVEN, CONN.**

**NOW IN STOCK**

METAL COLORING. A. H. Hiorns. 4½ x 6¾ inches; 324 pages.

A treatise covering the production of every shade of color which can be produced on metals. Discussed under, 1, chemical metal-coloring; 2, electro-chemical metal-coloring; 3, mechanical metal-coloring.

Price ..... $2.25

**A year's subscription to THE METAL INDUSTRY and "Metal Coloring" for only $3.**

The Scleroscope Set

## HARDNESS TESTING

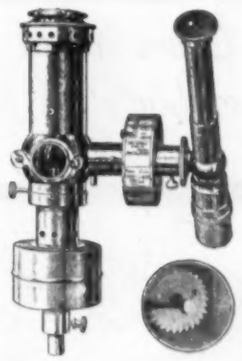
is now done by the scleroscope almost exclusively. The advantages gained are so positive that few firms are without it today. Send for our booklet free.

### The Pyroscope

is an optical instrument that has solved many heat indicating problems in hardening, forging, founding, etc. Inexpensive, simple, quick, constant. Pamphlet free.

Localized Hardening—Selective Carburizing
by the Shore Process

**Shore Instrument & Mfg. Co., Inc.**
555-557 West 22d Street, New York
Agents in all foreign countries



## Tube Rolling Mills
(PATENTED)

for seamless Copper and Brass, rolling tubes of from 1⅝" up to 12" outside diameter. Will change, for instance, a billet of 1⅞" diameter and 3 feet length in warm condition into a tube 9 feet long in 15 seconds.

New principles in other equipment for complete plants.

## L. WOLFFGRAM
815 West 10th St. Consulting Engineer Erie, Pa.

## WATROUS PROCESS QUALITY
### IN GALVANIZING

means a smooth, clean surface, without lumps or drips, EVERY PART OF WHICH WILL STAND THE U. S. GOVERNMENT TEST.

Users of galvanized bolts should insert in their specifications this clause:

"Every part of both nut and bolt must stand the A. T. & T. or U. S. Government four dip copper sulphate test. Nuts must fit reasonably close, but must run freely onto the bolt half the length of the thread."

You never could get this before, but now that you can, why be satisfied with any less?

For list of manufacturers in your vicinity who can furnish this class of work, write

**E. L. Watrous Galvanizing Company**
1625 Conway Bldg., Chicago, Ill.

HOEVEL SANDBLAST MACHINES
Patented.

Dustless Sandblast Cabinets, Rotary Table, Revolving Barrel Sandblast Machines, Hose Sandblast and all other Sandblast Equipment.

HOEVEL MANUFACTURING CORPORATION
Controlled by L. O. Koven and Brother
164 Ogden Avenue, Jersey City, N. J.
Cleveland Office, 503 American Trust Bldg.

## TINOL

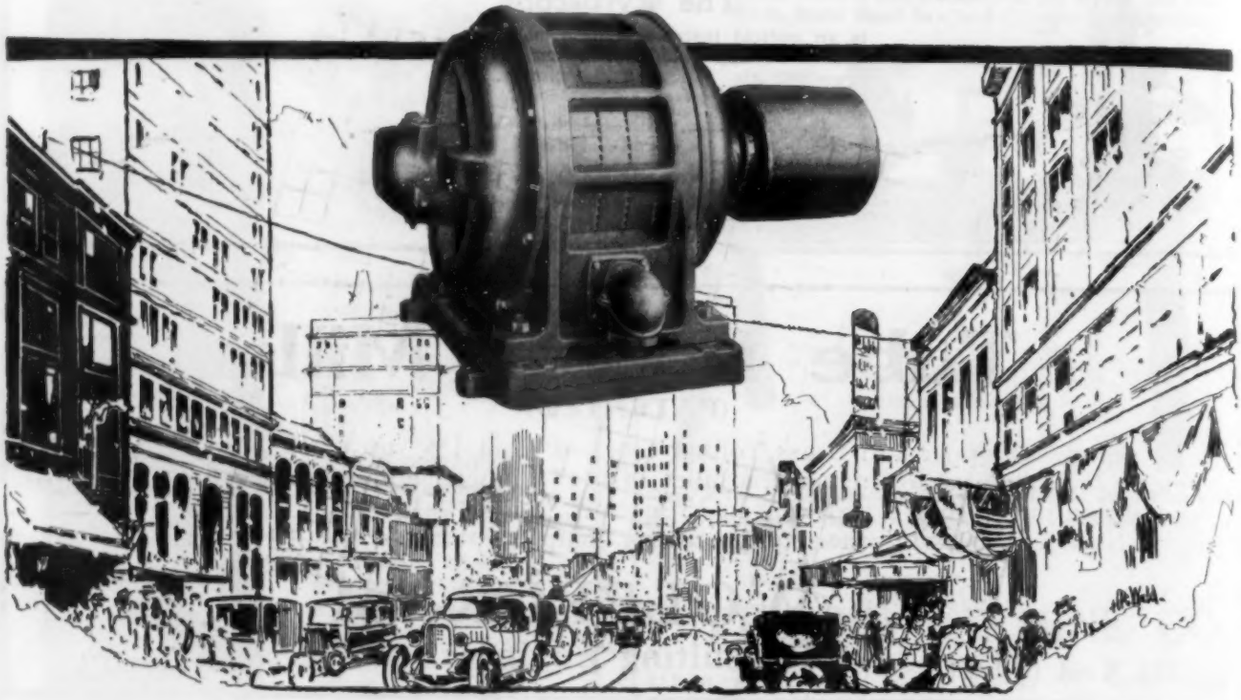
MADE IN U. S. A.
A COMPLETE SOLDER IN PASTE FORM
Solder and Flux Specialists
HESS & SON, 2913 N. 16th St., Phila., Pa.

## ARTCRAFT

FLUID SALTS PASTE
SOLDERING PRODUCTS
NON-ACID NON-CORROSIVE NON-RUSTING

Guaranteed to Do Good Soldering on All Metals
**Davis Process Company,** 10-12 Powers Street Brooklyn, N. Y.
Agents for
Columbia Smelting & Refining Works
Bar Solder—Wire Solder—Capping Solder

*Users want serviceable, durable, available G-E Motors that embody all features long experience has shown to be necessary*



ATLANTA, GA.

## An Able Motor

G-E polyphase induction motors have been more widely used than any others for well over a quarter century. In every industry they are known to be most dependable, even when operating under wet and gritty operating conditions.

Some of the first motors installed are still in daily operation, while many have come through fires and floods undamaged so no one knows how durable they are—probably no one will live long enough to find out.

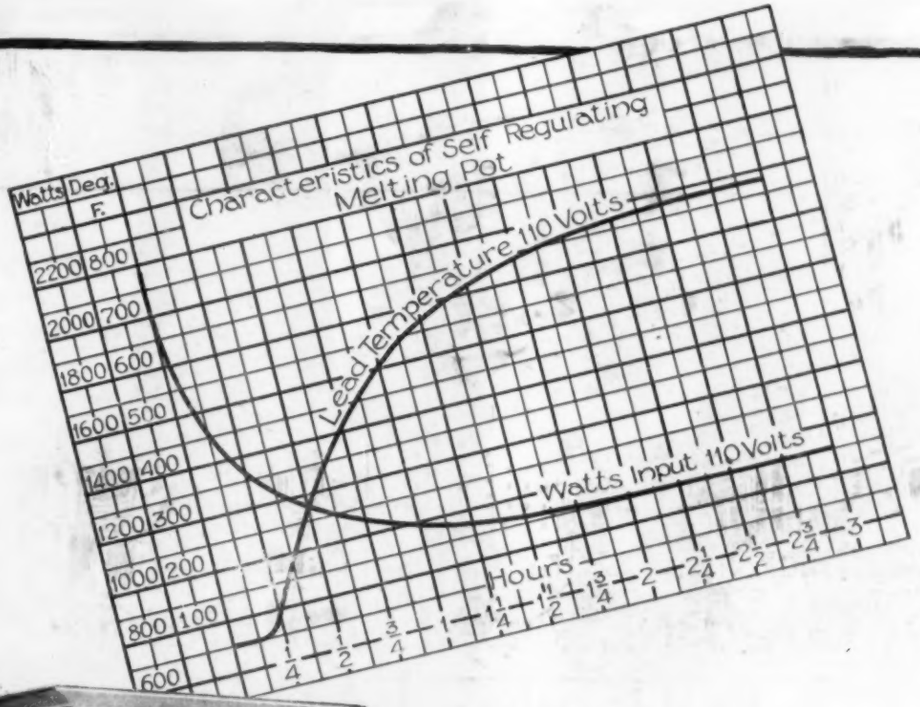
And these motors are available. You will find them stocked in all large cities with experts on their application near at hand to freely advise you.

**General Electric Company**

General Office Schenectady, N.Y.

43-145

***Modern industries are appreciably reducing their manufacturing costs by keeping abreast of the rapidly advancing use of electric heat.***



**Self Regulating Solder Melting Pot**
**Capacity, 25 Pounds**

## For Your Consideration

Just study the chart for a minute—note how the current consumption decreases as the heat increases—when the maximum temperature is reached, it remains constant. The temperature will never reach a point where solder will appreciably oxidize or form the usual heavy coating of slag.

The pot is a single casting with heating units on the sides and bottom, providing a very even distribution of heat and is jacketed with heat insulating material.

There is a bulletin completely describing this device which will be gladly sent you upon request.

**General Electric Company**
**General Office Schenectady, N.Y.**

30-30

# Another Point of Superiority—

No. 2 Polishing Lathe, "A" Type Spindle

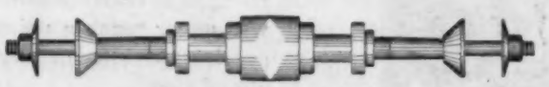
No. 3 Polishing Lathe, "B" Type Spindle

## GARDNER BALL-BEARING POLISHING LATHES

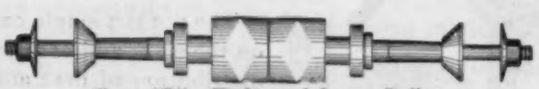
### are made with two types of spindles

Type "A," shown in the photograph at the left, has a single driving pulley, while Type "B" (at the right) has a tight and loose pulley, and the loose pulley is fitted with ball bearings.

**The Merits of These Types Are Self-Evident**



Type "A"—Tight Pulley



Type "B"—Tight and Loose Pulley

**You Can Buy to Suit Your Individual Requirements**

If you wish to avoid the use of a countershaft and belt direct from line shaft, the "B" type is what you need. Should you want to belt from countershaft, specify "A" type in ordering.

**Write for Our Polishing Lathe Folder and Learn of The Other Superior Qualities of the "Gardner" Line!**

## GARDNER MACHINE COMPANY

416 Gardner St. Beloit, Wisconsin, U. S. A.

New York Office: 6 Church St. Chicago Office: 32 N. Clinton St.

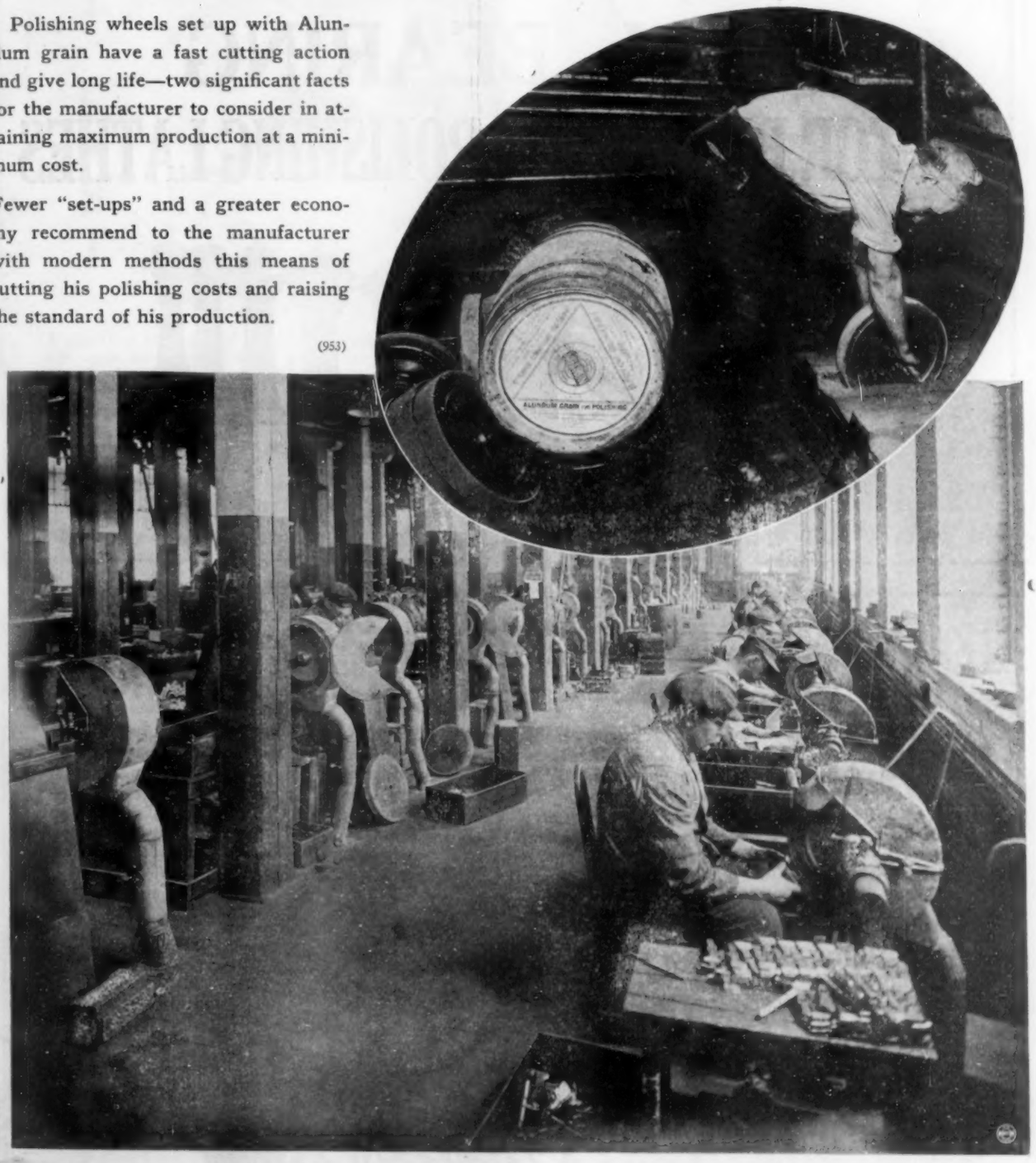
Representative in Great Britain: The Alfred Herbert Co., Ltd., Coventry, England.
Representative in Paris, Turin, Zurich and Barcelona: The Allied Machinery Company of America.

# ALUNDUM GRAIN BRINGS INCREASED PRODUCTION

Polishing wheels set up with Alundum grain have a fast cutting action and give long life—two significant facts for the manufacturer to consider in attaining maximum production at a minimum cost.

Fewer "set-ups" and a greater economy recommend to the manufacturer with modern methods this means of cutting his polishing costs and raising the standard of his production.

(953)



## NORTON COMPANY, Worcester, Massachusetts

New York Store
151 Chambers St.

Detroit Store
73 W. Congress St.

Chicago Store
11 N. Jefferson St.

# EAGER
## BALL BEARING
## MOTOR BUFFING AND POLISHING LATHES

**Fifteen Years of Success**

Fourteen years ago our first customer ordered two motor lathes on approval. This was followed shortly with an order for fifteen and this customer now has fifty machines in operation, ranging in size from five to fifteen horse power.

**EAGER machines installed over a dozen years ago and in constant use show no appreciable sign of wear. All motors on EAGER lathes are designed and built by us and consequently give better satisfaction than "assembled" machines made up of bought motors and parts. EAGER lathes all have ball bearings. The extra large arbors and bearings eliminate vibration. No starting device is necessary with our A-C motors. The large sizes are equipped with specially designed oil-immersed switches, enabling the start to be made with a minimum flow of current and without disturbing the line voltage.**

**It will be well worth while to consult us regarding your requirements.**

Sent on request—

Catalog A-100, giving dimensions, speeds, etc., of EAGER Motor Buffing and Polishing and Grinding Lathes.

Catalog A-200, describing EAGER Low Voltage Motor Generators, AC and DC Generators, Tank Rheostats, etc.

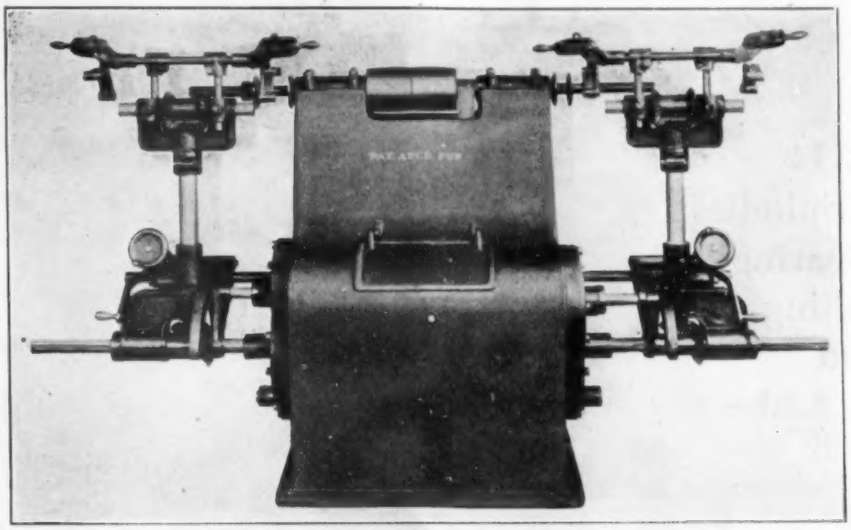
Eager A-C Motor Grinder

**The EAGER ELECTRIC COMPANY**

MANUFACTURERS

WATERTOWN, N. Y.

AT LAST



THE "DUPLEX"

A practical commercial **Automatic Buffing and Polishing Machine** that really **produces.** Handles cooking utensils, auto lamp reflectors or any other round articles which are free from projections.

Big production is possible because of the four spindles which hold the work, two of which are in action all the time while the operator is placing work on the other two.

The clamping device works instantaneously and is positive, thereby preventing the work from slipping, and avoiding the cost of expensive expanding chucks. The machine has a uniform stroke up to 10" long, and will buff taper work without the use of extra attachments.

**Send for full particulars and quotations**

## Duplex Buffing Machine Company

**582 Kensington Avenue** **BUFFALO, N. Y.**

# WOODISON QUALITY POLISHING COMPOSITIONS

## TRIPOLI CUTTING COMPOSITION
## K K K BRASS COLORING
## CRYSTAL NICKEL FINISH

### MADE of HIGHEST grade RAW MATERIALS

Try Woodison's Method. Buy the best.
It is the cheapest in the long run.

| | | | | |
|---|---|---|---|---|
| Sewed Buffs | Spanish Felts | Copper Anodes | Copper Sulphate | Tanks |
| Loose Buffs | Mexican Felts | Nickel Salts | Generators | Chemicals |
| Cloth Wheels | Nickel Anodes | Copper Carbonate | Accessories | Acids |

**WOODISON SERVICE FROM BRANCHES LISTED BELOW.**

# THE E. J. WOODISON COMPANY
## DETROIT, MICHIGAN

### THE E. J. WOODISON CO., LTD., TORONTO

***Foundry Supplies, Foundry Equipment, Platers' Equipment and Supplies***

| *Branches* | | *Branches* | |
|---|---|---|---|
| BUFFALO | CLEVELAND | ST. LOUIS | MONTREAL, QUE. |
| BOSTON | MILWAUKEE | SEATTLE, WASH. | WINDSOR, ONT. |

**No. 14 Double Spindle Ball-Bearing Polishing and Buffing Lathe**

**This is not a so-called "Polishing Jack"**

**Bulletin No. 27 gives full specifications of this strictly high grade machine**

This machine aside from having the spindles mounted in ball bearings is provided with two Johnson Clutches operated by hand levers as shown, facilitating stopping either end of machine for changing wheels, etc., without interfering with the other, obviating the necessity of other operative waiting while one is changing wheels.

THE WEBSTER AND PERKS TOOL COMPANY
SPRINGFIELD, OHIO, U.S.A.
P. O. Box 1500

**THE ORIGINAL WHITE COLORING COMPOSITION**

**EACH CAKE BEARS THIS IMPRINT**

**ALL OTHERS ARE IMITATIONS**

WHITE TRADE XXX DIAMOND MARK
BUFFING & POLISHING CAKE
MATCHLESS METAL POLISH CO.
NEW YORK-CHICAGO
REG. U.S. PAT. OFF.

MANUFACTURED ONLY BY

**THE MATCHLESS METAL POLISH CO.**

GLEN RIDGE, N. J. CHICAGO, ILL.

DISTRIBUTED BY

Apothecaries-Hall Co., Waterbury
A. T. Bagley & Co., Los Angeles
Bennet & Seeley, Bridgeport
Thos. Buchanan Co., Cincinnati
Brewer & Co. Worcester Providence Fall River Boston
General Supply Co., Cleveland
Walter C. Gold, Philadelphia
E. W. Long, New Orleans
Root-Neal Co., Buffalo
Spencer Bros., St. Louis
A. T. Wagner, Detroit

# To Executives in Charge of Metal Finishing

Our representatives will not call on you as solicitors—they are engineers.

They make a study of your metal finishing operations and equipment for doing the work. If they see any way you can save money in your polishing methods, they not only tell you so—but will prove it to you.

They go so far into the details of your work that they have to wash their hands, roll down their sleeves and put on their coats when finished.

They start in the office of an executive and end up in the shop with their coats off and their hands dirty.

There are no theories offered with their recommendations, just plain experience of hundreds of plants of all kinds.

If you are contemplating making any changes; if you would make the changes if shown that you should, a visit of one of our engineers may result in saving you an appreciable amount of money.

Your correspondence is solicited by

**DIVINE BROTHERS COMPANY**

**Engineering Department**

**UTICA - - - - - - NEW YORK**

# POLISHING COMPOSITIONS

We make a particular grade just suited to your requirements—

**whether for Nickel, Brass, Copper, Aluminum, Tin, or Celluloid Polishing**

Many years of successful manufacturing back our

**Rouges, Tripoli and Crocus Compositions; our Victor White Polish (Lime Finish), Snowflake Polish (White Coloring Composition)**

## GENERAL PLATERS SUPPLY CO., Inc.

489-91-93 BROOME ST. NEW YORK CITY

EVERYTHING FOR THE ELECTROPLATER AND POLISHER

## Platers and Finishers

get the best results only when the surface is prepared by using A PURE TRIPOLI COMPOSITION, made from

# REAL AMERICAN TRIPOLI

IN THE FOUNDRY, "TRIPOLI PARTING" is only a name, unless it is made of REAL AMERICAN TRIPOLI.

**BE SURE that you get REAL TRIPOLI by ordering from**

**AMERICAN TRIPOLI COMPANY, Seneca, Missouri**

Everything for the Plater

# BUFFS

ALL KINDS

**Warren Products Co., Inc.**
**296 Broadway, New York**

# BUFFS

Write, telephone (Canal 9246), or wire your wants.

## Polishers, Platers and Grinders' Supplies

NEW YORK BUFF COMPANY, INC.
202-204 CENTRE STREET NEW YORK

LIONITE — KING OF ABRASIVES — NIAGARA FALLS, N.Y. — GENERAL ABRASIVE CO.
Trade Mark

SEND FOR CIRCULAR

## THE IDEAL ABRASIVE–LIONITE

Because it is purer, harder, and sharper than emery or natural corundum.

Because it will cut faster and cleaner.

Because it is uniform, the same today, tomorrow and next year.

Because it is especially prepared to make it adhere to polishing wheels.

A trial will convince you.

GENERAL ABRASIVE CO.
Niagara Falls, N. Y.



C. UPHAM ELY MANUFACTURER OF
Superior Nickel Anodes, Purity and Quality Guaranteed. Polishing and Plating Supplies.
Dynamos COMPLETE PLANTS Rheostats
SEND FOR BULLETIN 62 Vesey St., New York

AMES SWORD COMPANY
CHICOPEE, MASS.
Manufacturers of
ENDLESS SEWED POLISHING BELTS
*Correspondence Solicited Discounts Quoted*

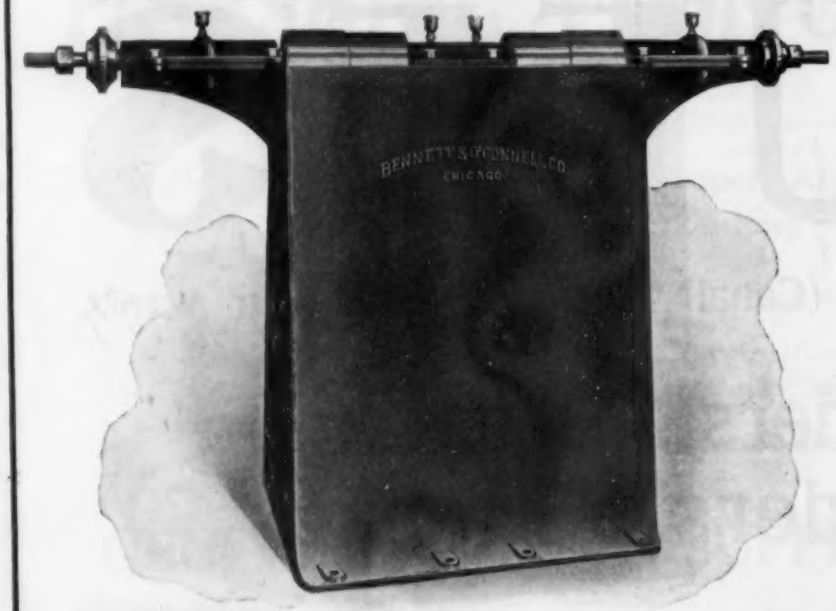
# EMERY

We Manufacture High Grade

Turkish and Greek Naxos

NIAGARA EMERY MILLS, Inc.
NEW YORK OFFICE: 50 Broad Street
MILLS Lockport, N. Y.
*Samples and prices sent on request*

# THE LATHE THAT PAYS FOR ITSELF




In these days when labor and power are so costly, it pays you to install in your plant any machine that will help to cut down either labor or power bills.

**The No. 20-A Double Arbor Polishing and Buffing Lathe will do both.**

This lathe saves the time of the operator because he does not have to change his position to stop or to start the wheel, whether belt-connected to a shaft overhead or from below the floor. Moreover, when two operators are working on this lathe, either may stop or start his work without interfering with the other, because there are two independent spindles. This lathe saves power because it runs smoothly and is constructed to operate efficiently.

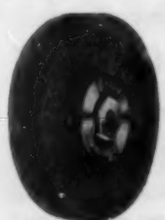
The frame is cast in one piece. The shafts are made of a high grade of carbon steel being turned and ground. The bearings are babbitted with the best grade of metal. They are ample in size and insure cool running. There is not the slightest vibration in the shaft. The No. 20-A lathes are designed and built for polishing and buffing large work.

**Send for Bulletin No. 102.**

## BENNETT-O'CONNELL CO. CHICAGO ILLINOIS

**MAIN OFFICE AND FACTORY: 3600 S. MORGAN STREET**
**EASTERN BRANCH: AYER-O'CONNELL MFG. CO., MERIDEN, CONN.**

OSBORN


Complete

Hub Cross Section

Section

## "Economy" Wire Wheels

cut cleaning and buffing costs. They do this work better, quicker and wear longer than the ordinary wire wheel.

"Economy" Wire Wheels consist of wire sections which fit into a permanent hub. Sections can be replaced in a few minutes.

The wire in these sections is drawn from special formula steel that does not crystallize or break off nearly as quickly as wire used in the ordinary wheel—resists wear—and wears down evenly.

Tell us your cleaning problems and we will suggest the best wire wheel for your needs. Also ask for Catalog 150-F describing Platers' Brushes, Wire Wheels, etc.

*THE CLEVELAND OSBORN MANUFACTURING CO.*
INCORPORATED

5408 Hamilton Ave., Cleveland, Ohio
Address Main Office or Branches, DEPT. H

| New York | Chicago | DETROIT |
|---|---|---|
| 3rd Ave. at 35th St. | 155 No. Clark St. | 94 McDougall Ave. |
| Bush Terminal Bldg. No. 5, Brooklyn | MILWAUKEE 259 So. Water St. | SAN FRANCISCO 61 First St. |

## ECONOMY ADJUSTABLE HOOD

Operates with much less suction than others and is more quickly adjusted and never in way of operator—

**SAVES POWER and TIME**

State height of spindle from floor and size of largest wheel used. We'll send one "on trial." If not satisfactory—return at our expense. We design and install Complete Dust Collecting Systems—can rid your polishing and buffing department of all dust.

*KIRK & BLUM COMPANY*
High Grade Dust Collecting Systems
CINCINNATI, O.

# BRUSHES

**Brass, Copper and Steel Wire Brushes**
An assortment of
**Machine and Circular Brushes**
**Chandelier Manufacturers', Silver and Nickelplaters' Brushes, etc.**
Repairs Promptly Attended to.

**H. BLUMENTHAL & CO., MFRS.**
ANDREW H. LAU, Sole Proprietor.
241-243-245 CENTRE ST., NEW YORK
Ask for Catalog "M."

1825-1919

**NINETY-FOUR YEARS**

Established 1825

Fourth Generation of Felt Manufacturers

**During the World War We Served**

Largest Rifle Manufacturers, Three Navy Yards,
Razor Manufacturers, Arsenals,
Gas Mask Manufacturers, Silver Manufacturers

**BACON Felt Polishing Wheels**

Ninety-four years of intensive service eliminates the element of experiment, and the trade is assured the right products and the right prices.

Spanish White Felt Wheels
Spanish Gray Felt Wheels
All grades of Sheet Felt
Rock Hard—Hard or Soft

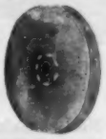
**CATALOG B ON REQUEST**

**BACON FELT COMPANY**
**WINCHESTER, MASS.**

**E. Reed Burns Supply Co.**
PLATERS and POLISHERS SUPPLIES
**40 and 42 Withers Street**
**21-27 Jackson Street**
**BROOKLYN, N. Y.**
**BRANCH** **CHICAGO**

**Send for Our Silent Salesman**
**Prices Talk Louder Than Words**

Largest Producers
SHEEPSKIN POLISHING WHEELS



LEATHER MEAL
For Tumbling Barrels

SHEEPSKIN
CUT FOR ANY PURPOSE

**YORKVILLE MANUFACTURING CO., Inc.** 273 Lorimer St., Brooklyn, N. Y.

**SINCE 1888**—Nothing but
**DUST COLLECTING SYSTEMS**
Since 1905—**SLOW SPEED, LOW POWER**
**THE ALLINGTON & CURTIS MFG. CO.**
Saginaw, Mich. So. Boston, Mass
Philadelphia, Pa., Rochester, N. Y. Chicago, Ill.

**U. S. A. BRAND FELT POLISHING WHEEL**

(under the name of Spanish White)

HAS STOOD ALL TESTS
FOR 23 YEARS

The Highest Grade
and
Lightest Weight
Wheel
on the Market
which proves
Purity of Stock
and
Standard Manufacture

TRY ONE

Other Brands:

**INDEPENDENCE**
(fine white)

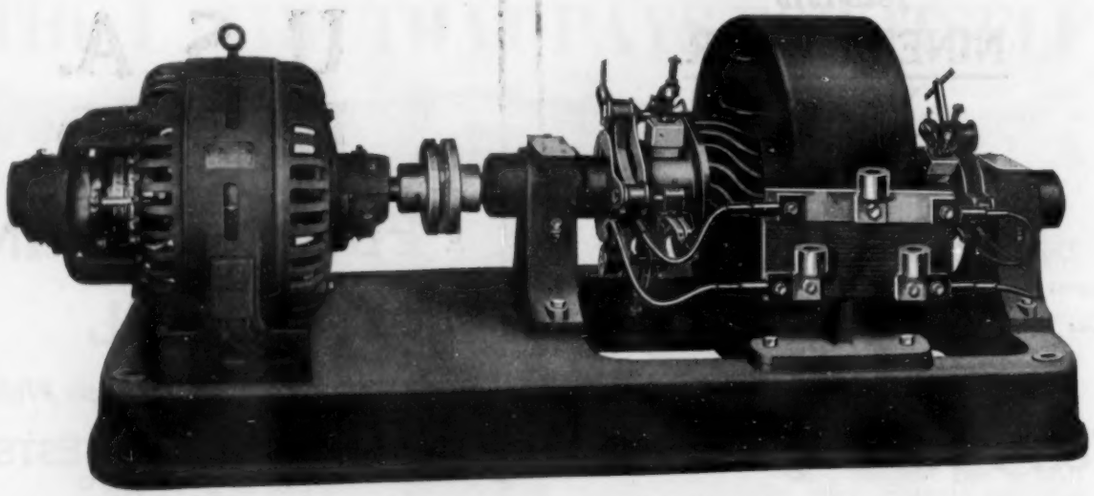
**VICTORY**
(coarse white)

**PEARL**
(medium white)

**JEWEL**
(coarse brown)

**X. L.**
(formerly grey Mexican)

**EASTERN FELT CO.**
Dept. A
WINCHESTER, MASS.
U. S. A.



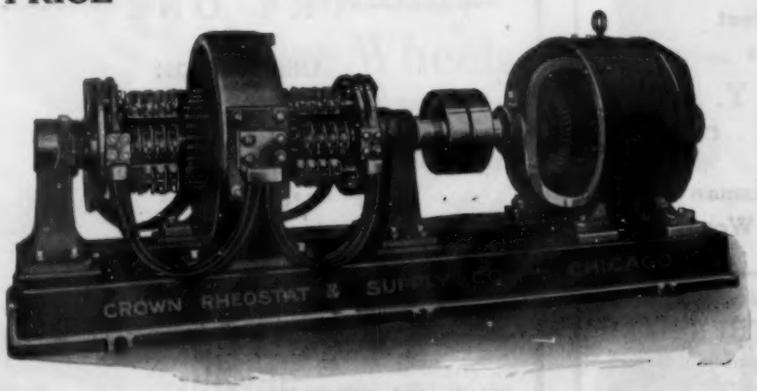
The Improved American Giant Dynamos have stood the test of service for thirty years. You will make no mistake if you install one in your plant.

**Write for our catalog.**

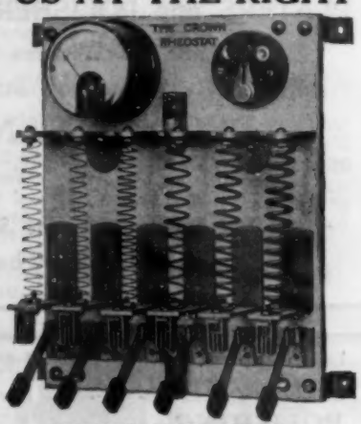
# Connecticut Dynamo & Motor Co.

**200 Lyons Avenue** **Irvington, N. J.**

**NO DOUBT YOU WILL FIND IN THIS LIST SOME ARTICLE YOU REQUIRE AND WHICH YOU CAN BUY FROM US AT THE RIGHT PRICE**




MAXIMUS DYNAMOS




CROWN RHEOSTATS

| | | | | | |
|---|---|---|---|---|---|
| Brass Anodes | Silver Anodes | Circular Brushes | Wire Dipping Baskets | Single Nickel Salts | Copper Sulphate |
| Copper Anodes | Gold Anodes | Scratch Brushes | Stoneware Baskets | Double Nickel Salts | Zinc Carbonate |
| Nickel Anodes | Caustic Soda | Scouring Brushes | Stoneware Jars | Copper Carbonate | Zinc Sulphate |

BUFFS CANVAS WHEELS FELT WHEELS SHEEPSKIN WHEELS
EMERY EMERY CAKE TRIPOLI COMPOSITIONS LIME FINISH
POLISHING LATHES TUMBLING BARRELS PLATING BARRELS

If you haven't our catalog, write for it.

# CROWN RHEOSTAT & SUPPLY CO.

**15-17 South Desplaines Street** **Chicago, Ill.**

# Tycos
## TEMPERATURE INSTRUMENTS

Indicating Recording Controlling

***Tycos Pyrometers Meet the Needs of the Metal Industry***

THEY measure the temperature of molten metal in either crucibles, non-crucibles or electric furnaces. Annealing core-drying, japanning, lacquering, and enameling are other applications for Tycos Pyrometers.

*Tycos* Hydrometers and Thermometers are used in heated plating and cleaning solutions. The Tycos Temperature Regulator is used to regulate the temperature of plating baths.

Complete information concerning *Tycos* Pyrometers and other Tycos Indicating, Recording and Controlling instruments for use in brass, bronze and aluminum foundries, brass and copper rolling mills and metal finishing shops, cheerfully forwarded on request.

*Taylor Instrument Companies*
Rochester, N. Y.

*There's a Tycos or Taylor Temperature Instrument for Every Purpose.* (JJ)

# Low Voltage Generators

Two or three wire arrangement, adjustable voltage on each side of the neutral. Built in sizes from 400 to 7000 ampere capacity, either belt or motor driven. Carbon brushes, reaction type brush-holders.

Our machines are full and large for full load continuous duty. Some have been in constant service for over 18 years and they are bringing us more orders. All machines are fully guaranteed.

Let us know your requirements and we will recommend the machine most suitable for your special work.

**JANTZ & LEIST ELECTRIC CO., Cincinnati, Ohio**

# DYNAMOS

For Electroplating, Electrotyping and Electro - Galvanizing in single, two and three voltages 60 to 10,000 Amperes 3 to 30 volts.

Shunt, compound and separately excited.

Write for catalogue "M"

**CHAS. J. BOGUE ELECTRIC CO.**

513-515 West 29th Street, NEW YORK
Cable Address "MACHELECT" 'Phone, 581 Chelsea

There is a

# Weston

## Electrical Indicating Instrument

for every purpose

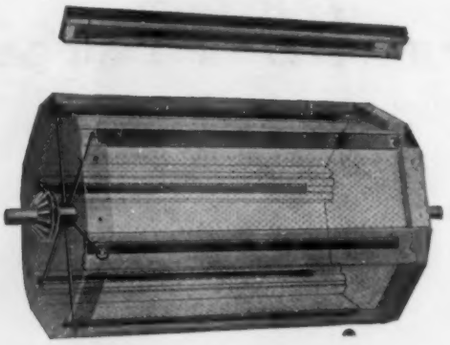
Thirty years ago Weston Round-Pattern Direct Current Switchboard Instruments were accepted as standard for use in electroplating. This enviable reputation has been retained through all the intervening years. They are the standard today. When equipping your plant can you afford to use inferior instruments?

**Write us for catalogs and bulletins**

**Weston Electrical Instrument Co.**

**155 Weston Ave., Newark, N. J.**

**Branch Offices in Leading Cities throughout the World**



# Mr. Manufacturer:

In introducing our new VICTOR PLATING MACHINE to the trade after years of experimenting, we are satisfied that we have the most practical plating machine made. In cost of operation, supplies and repairs it will save you money.

The VICTOR machine is made good and strong to stand long, hard wear. It has self-aligning bronze bearings, Bakelite cylinder heads and panels, with conductor strips on each rib, insuring contact in any position. Ribs or strips are removable and can readily be taken out for cleaning or replaced when worn out without tearing cylinder apart; simply remove nuts and lift out strip. (See illustration.)

Cylinder is elevated quickly without loss of time or materials, and can be rotated while in any position, making it especially adaptable for work containing deep cavities, as the cylinder can be run in an elevated position until all parts are thoroughly drained. There are no metal parts or gears in solution.

Fitted with worm drive, can be run from line shaft without countershaft.

**We have a complete plating, tumbling and burnishing plant in operation. Send us a small quantity of any parts you want plated, and we will finish and return them for your inspection.**

**MANUFACTURED BY**

## THE VICTOR MANUFACTURING COMPANY

**113 West Main Street** **Springfield, Ohio**

# To Protect Your Metal

or produce various metal finishes, it is to your interest to use the impervious film coating

# BREVOLITE

It is your guarantee of a satisfactory film-coating which will stand the most severe tests. Its composition is based on scientific and practical principles and is the result of over twenty years' experience in this field.

## WAUKEGAN CHEMCIAL CO.

WAUKEGAN ILLINOIS

*"The best that money buys—B. & S. supplies"*

THE

## Crown Plating Barrel

**The most practical Plating Barrel made because its**

**CYLINDER** is made of mahogany—will not swell or warp out of shape;

**INSIDE CONTACT STRIPS** run from center bearing along each rib of cylinder insuring continuous contact;

**SPLASH BOARDS** keep solution from anode rods;

**CONTACT TO CYLINDER** is always clean, running in bronze bearings;

**CONTACT STRIP** is covered to protect it from plating;

**GUARANTEED** and sold subject to approval.

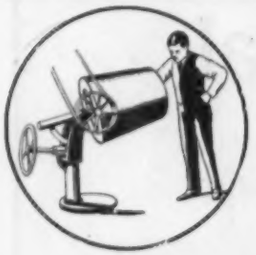
**Your inquiry for further information, prices, etc., will be promptly answered.**

**BENNETT & SEELEY**

FOUNDRY AND ELECTRO PLATERS' SUPPLIES AND EQUIPMENT

823 RAILROAD AVENUE
BRIDGEPORT, CONN.

*"The best that money buys—B. & S. supplies"*



# GLOBE

## UP-TO-DATE

# TUMBLING BARRELS

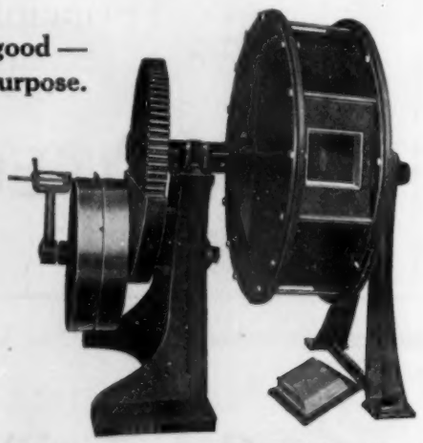
## FOR ALL PURPOSES

Among our 37 stock sizes you will find a barrel exactly adapted to your requirements. If not, we build special barrels to order.

**Take your choice — they're all good — Each type the best for a specific purpose.**

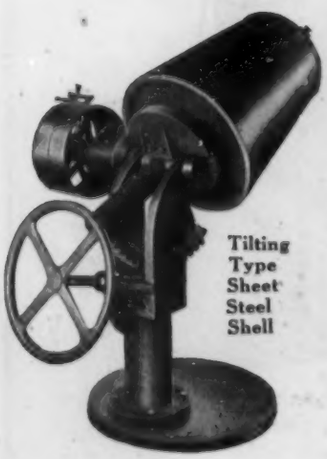
Write us fully about your work, if possible send samples and say just what you want to accomplish.

**Special Motor Driven Tilting Barrel**

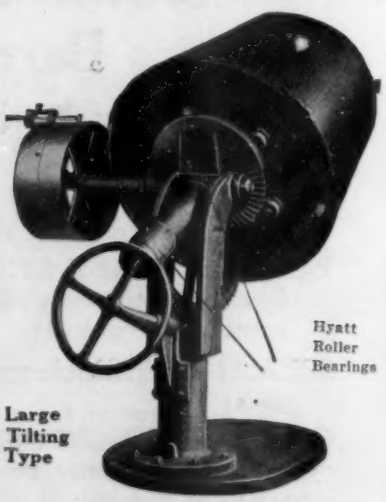


**Single Compartment Ball Burnishing Barrel**

**Tilting Type Wood Shell**



**Tilting Type Sheet Steel Shell**



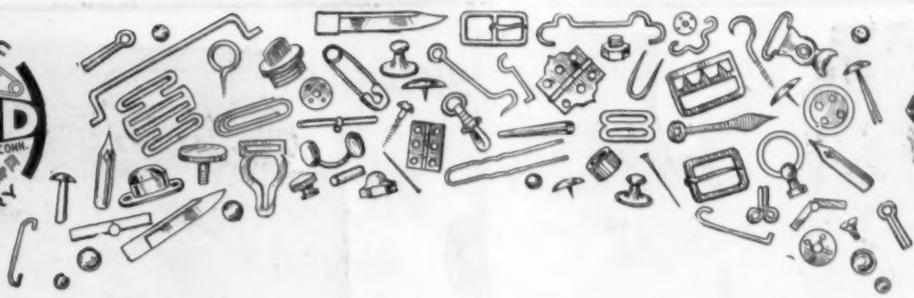
**Hyatt Roller Bearings**

**Large Tilting Type**

**The "Globe Tumbling Book" will help you to choose the right barrel for your particular work. Send for it.**

## The Globe Machine & Stamping Co.

**1259 West 76th Street** **CLEVELAND, OHIO**



# TUMBLING BARRELS

## All Types for All Purposes

Baird tumblers were not invented, but were designed, built, improved and brought up to date through practical work in regular shops under all sorts of conditions.

Grinding, smoothing, removing rust, scale, burrs, wire edge, pitts, hollows, bumps, knobs and all unevenness of surface.

Cleaning castings, shaking out or removing cores, sand, etc.

Polishing, burnishing or obtaining that bright and marketable finish.

Japanning, coating, rust proofing, painting, lacquering and applying protective or ornamental finishes to surfaces.

Mixing, drying and heating powders, drugs, paint bases and all manner of substances.

Heating, mixing and evaporating liquids, paints, pomades, oils, pastes, greases, etc.

Oblique tilting tumblers, horizontal tumblers, exhaust and non-exhaust tumblers.

Single barrel, double barrel and four barrel machines.

Wooden barrels, cast iron, sheet iron, cast brass, sheet brass, copper or metal barrels wood lined.

Stock barrels in various shapes and sizes, with special barrels made to order.

Double shell or steam heated barrels and barrels that can be cooled with brine or running water.

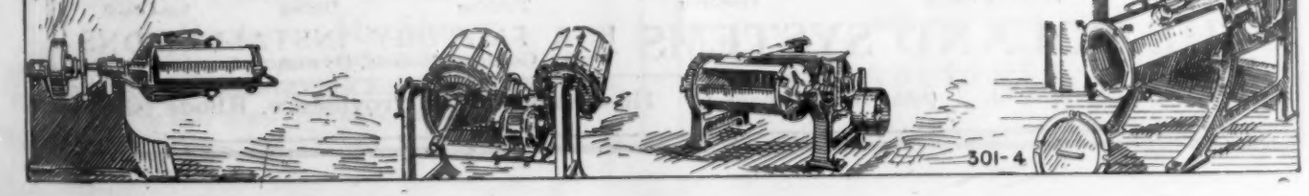
Ball burnishing machines or barrels and sawdust separating or cleaning machine.

Over fifty years building these labor-saving tumblers and with "Baird" barrels operating in every part of the world.

## THE BAIRD MACHINE CO.

BRIDGEPORT, CONNECTICUT

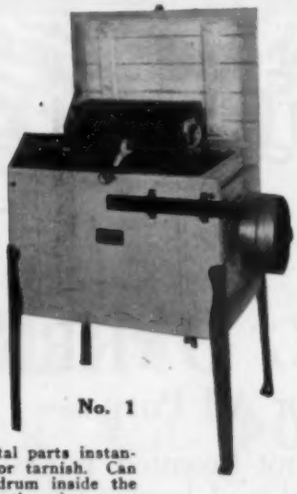
FENWICK FRERES & CO., Paris, France
R. CRUICKSHANK, Birmingham, England
ZAYAS-ABREU COMMERCIAL CO., Havana, Cuba
B. V. CONSTANTINOV INDUSTRY CORP., Moscow, Russia



301-4

No. 21
Pat. Apr. 14, 1914.

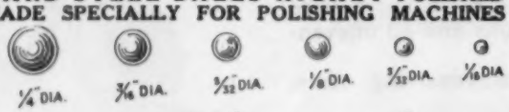
**Richardson Drying-Out Machine**



No. 1

For drying out jewelry and small metal parts instantaneously without leaving any spots or tarnish. Can be operated by anyone. The steam drum inside the barrel keeps the sawdust hot. After the pieces are dried the cover is removed from the barrel and the contents drop into the sieve below, the sawdust going through into the draw below, from which it is returned to the barrel ready for another batch.

**HARD STEEL BALLS HIGHLY POLISHED MADE SPECIALLY FOR POLISHING MACHINES**




**STEEL SPICKETS**

**THE S. R. BURNISHING CONE**

No. 12
Pat. Sept. 17, 1912.
Six Apartment Machine

# IMPERIAL

## POLISHING OR BURNISHING MACHINE

**Made with one, two, three, four or six apartments.**

is a big saver in many ways—very low power cost, no skilled labor needed, and it only costs you from four to six cents per week for solution. All that's needed besides the water is some soap powder and steel balls; we can supply you with either, or both. The hard steel balls, which we furnish, are polished just right for the work intended and like our machines are made to last.

**We specialize in these Machines and know we can please you. Send samples of articles for demonstration if you desire; no charge, glad to do it.**

**Send for Catalog M-I**

## SMITH RICHARDSON CO.

**Attleboro, Mass., U. S. A.**

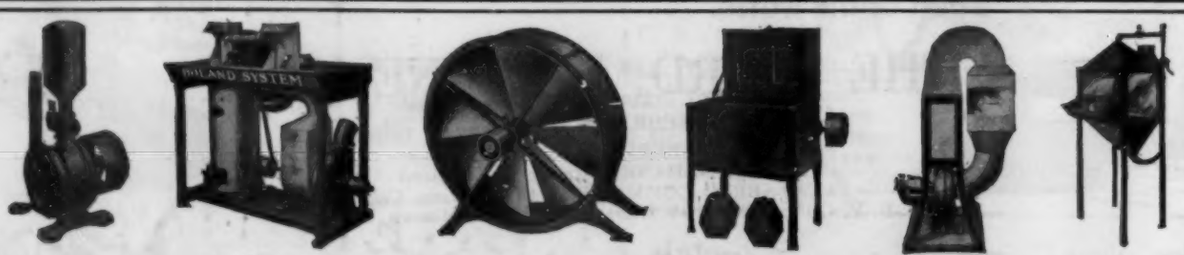
**Better work—larger production—lower costs. These invariably follow the introduction of the ABBOTT PROCESS of Polishing, Buffing and Burnishing. Adapted to nearly all kinds of small metal goods and parts. Send Samples of your work (express prepaid) for us to finish for you.**

*Ask for BOOKLET "ABC"—sent free on request*

## THE ABBOTT BALL COMPANY

**Originators of the most extensively used modern methods of commercial ball burnishing**

**Abbott Street Elmwood District Hartford, Conn.**




**Blower** **Polishing Bench** **Ventilator** **Tubbing** **Drying** **Sand Blast**

## THE BOLAND SYSTEMS FOR FACTORY INSTALLATIONS

**Tanks, Coloring Rooms, Dynamos, Sawdust Boxes**

**H. J. ASTLE & CO. (Send for Catalogues) 118 Orange Street, Providence, Rhode Island**

## SIMPLICITY and DURABILITY

are the basis of all

# HENDERSON

## Tumbling Barrels

Hundreds of firms are using our barrels in preference to all others, finding that maintenance and operating costs of same are negligible.

Every part in a Henderson Barrel has a definite purpose, one of our aims being to eliminate unnecessary parts.

If you need a Tumbling Barrel of any description consult us.

Cut Shows No. 5 Tilting Oblique 16" Japan Barrel.

## THE HENDERSON BROS. CO.

**135 South Leonard St., Waterbury, Conn.**

MANUFACTURERS SINCE 1881 OF RELIABLE TUMBLING BARRELS OF ALL TYPES

## COPPER CARBONATE
## PLATERS CHEMICALS
## ZINC CARBONATE

**Asphaltum & Chemical Products Co.**

1021 Park Row Building NEW YORK

BRASS, IRON, COPPER

## DIPPING BASKETS

**Any Shape, Size or Mesh**

Most highly recommended baskets. Extensively used throughout New England for many years. We make our own wire cloth, so can quote attractive prices. Send for Pamphlet "B."

**JOHN P. SMITH & CO.**

495 State Street, New Haven, Conn.

Mfrs. of Wire Cloth, Wire Machinery Guards, Wire Work for Every Purpose

**Books on Plating Books on Metals**
**Books on Machinery**

SEND FOR PARTICULARS

THE METAL INDUSTRY, 99 John Street, NEW YORK

Member of the Audit Bureau of Circulations

## CHAS. COOPER & CO.

**194 WORTH STREET, NEW YORK**

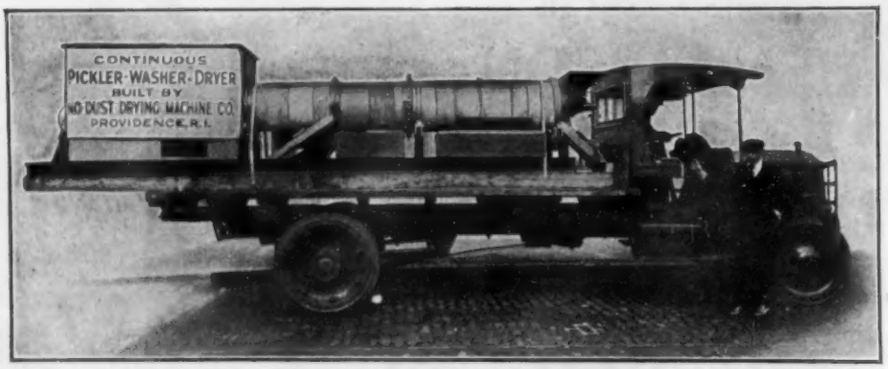
A FULL LINE OF

# CHEMICALS

SEND FOR PRICE LIST

ESTABLISHED 1857

# Here's Another Repeat Order on Its Way!



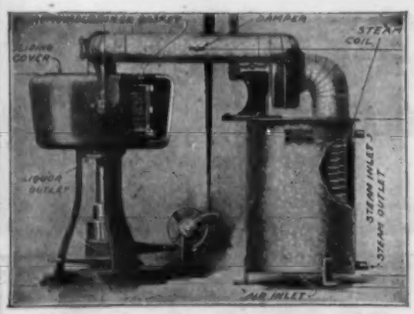

We like to receive repeat orders; they are quite convincing.
A prospective customer was in our shop the other day and expressed surprise that a well-known but smaller concern was always able to underbid them on several lines.
The competing concern says "the No-Dust machines are the best."
They have used No-Dust machines for years. They know.
The better way, the No-Dust way.
Superior machines for metals—pickling, washing, lubricating, drying, polishing. Special machines for special work.

## NO-DUST DRYING MACHINE COMPANY

**Providence, R. I.** **U. S. A.**

TOLHURST

## Metal Dryer




**With Removable Basket**

**Sizes 12" to 40" diameter**

### Scrap the Sawdust

This speedy and economical machine dries and polishes small metal goods without the use of sawdust or other trouble-breeding accessories. Leaves a durable, fine finish, without tarnish. Used universally.

*Send today for catalogue.*

## TOLHURST MACHINE WORKS

**Established 1852** **TROY, N. Y.**

**New York Office, 111 Broadway**

| Southern Rep. | Western Rep. | Canadian Rep. |
|---|---|---|
| Fred H. White | John S. Gaze | W. J. Westaway Co. |
| Realty Bldg. | Hartford B'dg. | Sun Life Bldg. |
| Charlotte, N. C. | Chicago, Ill. | Hamilton, Ont. |
| | | 400 McGill Bldg. |
| | | Montreal |

# CAUSTIC SODA 76% GRANULATED

All size packages

Originators of the process of pulverizing.

Our product is recognized as standard.

For your

## Alkali Bath use Banner Lye

½ ounce to the gallon of Hot Water

Absolutely Uniform—No Guess Work

Packed in 10, 25, 50 and 100 lb. cans and in barrels about 500 lbs.

**THE**

## PENN CHEMICAL WORKS

**PHILADELPHIA**

# An Announcement

## The "NIVIN Metal Parts Washing Machine" Becomes the "Crescent"

COMMENCING with December 1st, the Nivin Metal Parts Washing Machine, which has been saving time and labor, and helping to increase production in hundreds of the country's leading plants in the metal industry, will be known as the

**Crescent**
**Metal Parts Washing Machine**

The Crescent Washing Machine Company, manufacturers of the well-known Crescent Washing Machines, is the *original* and parent company under which the Nivin Manufacturing Company, makers of the Nivin Metal Parts Washing Machine has operated.

The change of name is made solely for the purpose of identifying our product more closely with the company, which makes (and always has made) this widely known metal parts washing-machine.

### There will be absolutely no change in the machine, factory, personnel or policy

The new name will in no way affect the machine, the factory, the manufacturing personnel, or the policy of the company. The parent organization remains intact—and the manufacture of the machine will continue under the same roof as before—everything identically the same except the name of the machine and the company.

**Crescent Washing Machine Company**
*(The original NIVIN Mfg. Co.)*
**841 Larrabee Street**
**CHICAGO**

COPPER CARBONATE
ZINC CARBONATE
DOUBLE NICKEL SALTS
SINGLE NICKEL SALTS

NICKEL ANODES

HYDROFLUORIC ACID
BONE ASH
BLUE VITRIOL
CYANIDE

JOHN C. WIARDA & COMPANY
273 GREEN STREET BROOKLYN, N. Y.

STEARNS TANKS

EVERYTHING IN WOOD OR WOODWORK 1849

70 Years' Experience
has made us thoroughly familiar with all tank requirements of the plating industries.
We recommend Eastern White Pine for asphalt lined tanks; Cypress for unlined tanks.
*Have You Our Catalog?*

THE A. T. STEARNS LUMBER COMPANY
30 Taylor St. Neponset, Boston, Mass.

ESTABLISHED 1865
CORCORAN PLATING TANKS
NEED NO LINING

Also tanks for Dyeing, Bleaching, Galvanizing, etc.
A. J. CORCORAN, Inc.
749 Jersey Avenue
JERSEY CITY, N. J.

ATLANTIC TANK & BARREL CORP'N
ESTABLISHED 1853

Tanks Any Size or Shape, for Any Purpose
Plain or Lined
15th & Jefferson St. Hoboken, N. J.

Strength-Service-Durability
These are the prime characteristics of our
LEADLINED TANKS
40 years' experience.
CHADWICK-BOSTON LEAD CO.
162 Congress St., Boston, Mass.

Acid Proof
Stoneware Tanks
Made of one piece, without joints. No depreciation. Afford clean handling.
General Ceramics Company
50 Church Street New York City
PLANTS AT KEASBEY, N. J.

Any Size or Shape.
Prompt Shipment
Send Us Your Specifications
Ask for Catalogue
KALAMAZOO TANKS
KALAMAZOO TANK & SILO CO.
Kalamazoo Michigan

# JOB PLATING

**Largest Jobbing Facilities in New York City**

Established 1889

Plant Bounded by Centre, Broome and Lafayette Streets

PLATING, POLISHING, DIPPING, LACQUERING, BARREL PLATING AND TUMBLING

Special Department for Plating Snap Fasteners Manufacturers' Work Our Specialty

PROMPT ATTENTION GOOD WORK

**PHILIP SIEVERING** 410 Broome Street NEW YORK

Telephone: Spring 2577

# Scrutinize Our Work

Subject it to the severest tests; inspect our own commercial plant at Mount Joy—you will then know that we speak the truth when we say that

## NEW STANDARD HOT TINNING EQUIPMENT

Saves tin, labor and time, producing at low cost a smooth, uniform rust-proof coating that stays on indefinitely.

We offer you our reliable job tinning service or we will install a complete up-to-date plant in your own works for hot-tinning any kind of product or for

## LEAD COATING

all kinds of metals

We also solicit business in grey and malleable iron castings and brass and steel stampings.

---

**NEW STANDARD HARDWARE WORKS**

Inc.

MOUNT JOY, PA.

PLATING EQUIPMENT

# ELECTRO-GALVANIZING

Faster —— Better —— Cheaper

### Job Galvanizing

| | |
|---|---|
| Bars | Bolts |
| Pipe | Nuts |
| Plates | Spikes |
| Structural | Washers |
| Castings | Nails |
| Stampings | Rivets |

Large Work Our Specialty

Capacity 20 Tons Per Day

### Standard Galvanizing Solution

Self Sustaining
Single Operation
Rapid Deposition
No Regeneration

SAVES—One dollar per year for power for each gallon of solution.

SAVES — Two-thirds of Labor—Material—Time.

## The Galvanizing Corporation of America

242-252 Eagle Street Brooklyn, N. Y.

OUR BOOKLET No. 2—YOURS FOR THE ASKING.

# MARBURG'S FACTORY HOUSEHOLD DAYLIGHT

CLEAN YOUR WINDOWS with

D A Y L I G H T

Removes iron rust and grease. May also be used for scrubbing floors, also on brass, copper, nickel, steel, aluimnum, tin, etc. Rub off with old newspapers; no rags or waste necessary. No dust, no cake to break, no waste in labor, not even necessary to wait till it dries.

**DAYLIGHT CLEAN-ALL CO.** 17 West 32nd St. New York, U. S. A.

# NATROLIN
TRADE MARK

AN HONEST

METAL CLEANER

SOLD IN AN HONEST WAY

**W. A. FULLER CO., Inc.**
GREENSBURG, PA.

**Quick-Thorough**
and
**Low-Cost Metal Cleaning**

ESCO — Mineral Cleaner For Cleaning Metal PATENTED

Is a program at which Esco mineral cleaner excels. Combines the forceful energy of a caustic with the harmlessness of a soap—a new substance with 10 years of satisfying service behind it. Order a few barrels today. The price is right.

**The Electric Smelting & Aluminum Co.**
Lockport, N. Y.

# KALYE
(Trade Mark)

FOR PREPARING METAL SURFACES FOR PLATING, &c.
SAMPLE CAN SENT FREE

Correspondence Solicited Mention this Journal
H. M. ANTHONY CO., Agent
261 Greenwich St., New York

**ATTENTION!**

Your customers want a reliable, durable oxidized finish. The Liver of Sulphur that has held the record for sales in these United States is

TRI-B BRAND **SULPHURETTE**

and for these reasons: Quality, Price and Delivery. Be sure that your jobber gives you the genuine product. We want your business. Write now.

**C. G. BUCHANAN CHEMICAL CO.**
MANUFACTURING CHEMISTS
Cincinnati, Ohio. U. S. A.
Factory: Baker St. & N. & W. Belt Line, Norwood, Ohio

# ECONOMY — EFFICIENCY

*are assured by the use of our*

# METAL CYANIDES

*in copper, brass, zinc or silver plating solutions*

***Metal Content — Copper 70% Zinc 55% Silver 80½%***

***The services of our staff of experts are at your disposal to help assure the splendid results obtainable with our products***

# POLYSULPHIDE

*best oxidizing agent for Copper, Bronze, Silver, etc.*

***WE SOLICIT YOUR INQUIRIES FOR THE FOLLOWING:***

## SODIUM CYANIDE 96/98%

## NICKEL SALTS, Single and Double

***Sulphocyanide Soda***
***Zinc Sulphate***
***Bluestone***
***Soda Ash 58%***
***Caustic Soda***
***Ammonium Chloride***
***Aluminum Sulphate***
***Bisulphite Soda***
***Hyposulphite Soda***
***Trisodium Phosphate***

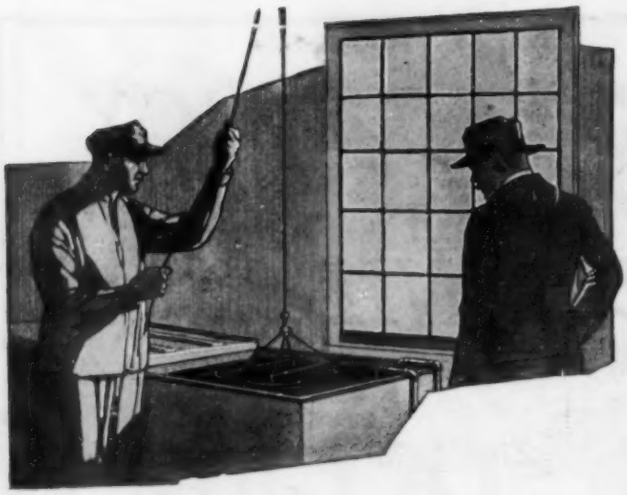
***THE***

## ROESSLER & HASSLACHER CHEMICAL CO.

***MANUFACTURERS***

***100 William Street, New York***

***Branches: Boston, Chicago, Cincinnati, Cleveland, Philadelphia, Kansas City, San Francisco***



## *Oakite Cleans Before Plating Without Rag-Wiping*

THE Plating Division of a large silverware plant formerly used whale oil soap for cleaning its "flat work", which comes to the cleaning room in a very dirty, tripoli-covered condition.

After the soap bath every piece had to be separately handled and rag-wiped by girls before it could be plated.

This method of cleaning was slow, inefficient, and costly as compared with Oakite methods and materials now used in this plant.

*With Oakite, articles are perfectly cleaned at the rate of 72 gross every 10 minutes.*

This Advertisement is one of a series based on actual occurrences.

The time-wasting, rag-wiping operation was discarded. The cleaning girls are now working to better advantage in another department.

*Correspondence Invited*

**OAKITE**

MANUFACTURED BY
OAKLEY CHEMICAL CO.
18 THAMES STREET · NEW YORK

## For Metal Cleansing

For this important work, alkalies should be carefully selected by chemical composition, otherwise users will frequently fail to get the desired results.

# SOLVAY ALKALIES

adapted to metal cleansing purposes include standardized forms of

**Modified Soda** **Causticized Ash**
**Caustic Soda** **Soda Ash**

These products are highly refined, and analyze as specified. Their use assures economy in cost and satisfaction in results.

## Solvay Technical Service

will be glad to aid you to determine the right alkali product to use in any special case, or under unusual conditions, and to give helpful hints to get improved results. Solvay Service is maintained for users of Solvay Products, who are invited to consult it freely, without charge.

*Booklet on "Metal Cleansing" mailed upon request*

SYRACUSE, N. Y.

DETROIT, MICH. HUTCHINSON, KANSAS

Selling Agents: Wing & Evans, Inc.
22 William Street, New York City

Branch Office, 89 State St., Boston, Mass.

AS the year nineteen hundred and nineteen draws to a close, we wish to take advantage of this occasion to express our sincerest appreciation for the confidence you have manifested as expressed in the extensive and rapidly increasing demands for the products of our manufacture.

And it will be our pleasure during the approaching year to be of still greater service, and to always maintain the same uniform high qualities that have characterized the Wyandotte Cleaning Specialties in the past so as to justify a continuance of these same cordial and reciprocal relationships.

THE J. B. FORD CO.
Sole Mnfrs.,
Wyandotte, Mich.

## *Oakite Saves $1,000 Monthly By Replacing Caustic in Cleaning Room*

THIS PLANT formerly cleaned steel stampings with caustic before tinning. All other materials had failed to produce a chemically clean surface.

They used pure lard oil in stamping out the steel parts, because they had found this oil the easiest to remove. The pure lard oil costs $2.10 a gallon.

Oakite materials are now used in the cleaning tanks and the work is cleaned easily and quickly. It was found unnecessary to use lard oil in the stamping as Oakite materials will remove any kind of oil.

This made possible the use of a mixture of 75% mineral oil and 25% pure lard oil. This mixture costs only 47c. a gallon.

| | |
|---|---|
| Cost of oil *before* using Oakite.... | $2.10 a gal. |
| Cost of oil *after* using Oakite..... | .47 a gal. |
| Saving..... | $1.63 a gal. |

This Advertisement is one of a series based on actual occurrences. M. M.

Close to 500 gallons of oil are used in the stamping room each month. This means, therefore a monthly saving of almost *One Thousand Dollars.*

In seeking advice on cleaning problems, look for broad experience and ability. It is the surest, safest way to find sound counsel.

***How May We Serve You?***

# OAKITE

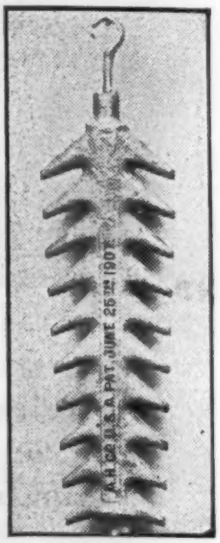
MANUFACTURED BY
OAKLEY CHEMICAL CO.
18 THAMES STREET · NEW YORK

# The Deloye Patented Anode of Nickel, Copper, Brass, Zinc

It is a well known Law of Nature that an electric current will flow more readily from a point than from a smooth surface.

This is the reason that our Deloye Patented Nickel Anode will produce a required deposit of Nickel in about one-quarter less time, and more uniformly than can be obtained from any other style of Anode.

We carry a large stock of these anodes all ready for immediate shipment. We make them in different lengths from 12″ up to 30″, weighing about one pound to the inch, and equip them with any style hook.



FROM ACTUAL PHOTOGRAPH

**We carry a full line of electroplaters' supplies and earnestly solicit your inquiries and orders**

**APOTHECARIES HALL COMPANY** 18 BENEDICT STREET WATERBURY, CONN.

# H F & G

**If it's a question of Economy and you are ordering either Anodes or Compositions,**

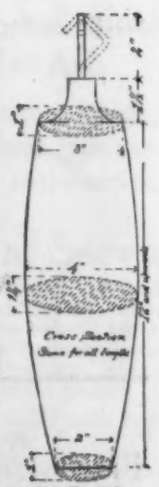
**The answer is**

## Economy Anodes and Economy Compositions

They Are Manufactured by

**THE HARSHAW, FULLER & GOODWIN CO.**

CLEVELAND NEW YORK PHILADELPHIA CHICAGO



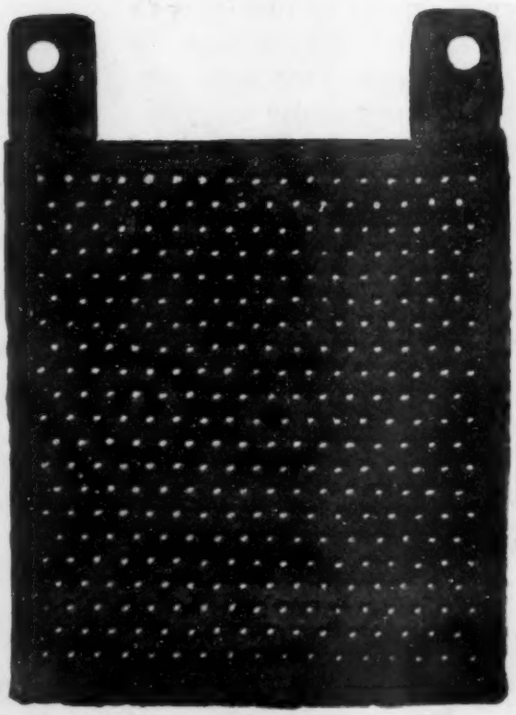
H. F. & G. "ECONOMY" ANODE

# Removal Notice

To provide for the vastly increasing volume of our business we will be located on and after February 1st in our new and spacious premises, East 10th to East 11th Streets, between Vernon and East Avenues, Long Island City, New York.

# Swiss Copper Anodes

Patented Feb. 25, 1919



SWISS ANODE

## Absolutely Without Waste

THE PUREST COPPER ANODES
EVER PUT ON THE MARKET

A Radical Improvement in Copper Deposition.

Saving Money, Time and producing a better deposit than ever heretofore possible.

Swiss Copper Anodes are made by depositing the purest of copper on a lead starting sheet (Grid). The holes in the Anode allow the electrolyte to circulate freely; making the whole surface active and not only the edges, as in the old style Anodes.

In the old style Anodes the surface gradually diminished until an irregular stub which had to be scrapped was left, whereas in Swiss Anodes the full surface is always available until all the copper is consumed.

Swiss Anodes require no cleaning—remaining bright from start to finish, insuring constant, rapid and smooth deposition.

When the copper is all off, you return the grids to our refinery for full credit, at price paid per lb. for the new anode.

Try out a tank equipped with Swiss Anodes and the many advantages will be readily seen.

Standard sizes are 8 x 12, 12 x 18, 12 x 24, 12 x 36. These sizes do not include ears, which are 3 inches long.

# BOSSIER ELECTRIC CO.

EXCLUSIVE MANUFACTURERS

**"WORLD" Dynamos**
**205 West 19th Street**

**"WORLD" Plating Barrels**
**New York City**

# What is the A. B. C.?

The Audit Bureau of Circulation is an Association of reputable publishers who are co-operating with advertisers and advertising agencies to standardize circulation data, place the buying of space on a basis of "Known value," and discountenance practices inimical to the interests of the advertisers.

The Bureau was established in 1914 and now numbers among its members the majority of honorable publishers in the United States and Canada. Its Board of Directors is composed of 11 national ADVERTISERS; 2 advertising agencies; 2 newspaper, 2 magazine, 2 farm paper and 2 trade paper publishers.

Twice a year the publisher makes a report to the Bureau showing total circulation and details of distribution by states, cities, towns, suburbs and rural districts; also subscription rates and facts about contests, premiums and club offers. Once a year these statements are audited by one of the Bureau's experts.

The advertiser is thus enabled to analyze the circulation of a paper and determine its value to him as an advertising medium.

A. B. C. statements are furnished to advertisers free of charge by the publishers.

By patronizing A. B. C. papers, advertisers serve their own interests and also participate in a nation-wide movement to place advertising on a sound, business basis.

Headquarters of the Audit Bureau of Circulations is at 202 South State Street, Chicago, Ill.

# THE METAL INDUSTRY

is the only journal devoted exclusively to the metal (not iron) and plating trades that is a

MEMBER OF THE AUDIT BUREAU OF CIRCULATIONS

SEND FOR OUR LATEST A. B. C. REPORT

**THE METAL INDUSTRY, 99 JOHN STREET, NEW YORK**

# Do Full Justice to Your Own Interests

**by investigating the superior features of**

# "RELIANCE"

## Plating and Polishing Equipment and Supplies

We invite your inquiries for everything needed, from a single item to a complete plant.

| | |
|---|---|
| **Dynamos** | **Reliance White Finish** |
| **Rheostats** | **Nubian Lime Finish** |
| **Ball Bearing Lathes** | **Crocus** |
| **Motor Lathes** | **Rouge** |
| **Plating Barrels** | **Metal Cleaner** |
| **Tumbling Barrels** | **Nickel Strip** |
| **Glue Pots** | **Belt Dressing** |
| **Tripoli** | **Etc.** |
| **Nuwhite Coloring** | |

**Steel Ball Burnishing Barrel**

If you have a lot of old buffs lying around, send us an order for one or more **Reliance Utility Buff Hubs** by means of which you can utilize the old remnants, making them up into good, serviceable, 14" buffs—A big economy.

"RELIANCE" products and L'HOMMEDIEU Service mean economy and satisfaction all the way through.

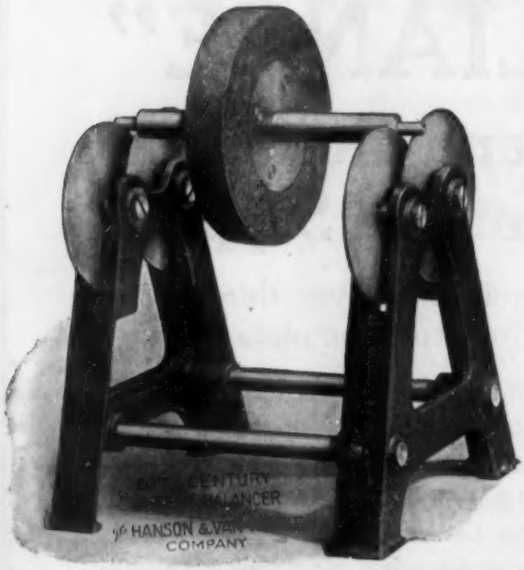
**Ball Bearing and Other Polishing Lathes Described in Bulletin No. 10. Write for It.**

## Chas. F. L'Hommedieu & Sons Co.

**Office and Factory: 4521 Ogden Ave. CHICAGO, ILL. Salesroom: 26 So. Clinton Street**

# We Make Many Useful Specialties that Help

## A few minutes saved each day by each worker using H. & V. W.




Twentieth Century Balancing Tool. The most practical tool ever gotten up for balancing polishing wheels, pulleys, cones, armatures, etc.

Our customers should not overlook the fact that besides the enormous volume of business we do in standard equipment and supplies we make numerous special devices which should find a place in all up-to-date plating, polishing, grinding and electro-galvanizing shops.

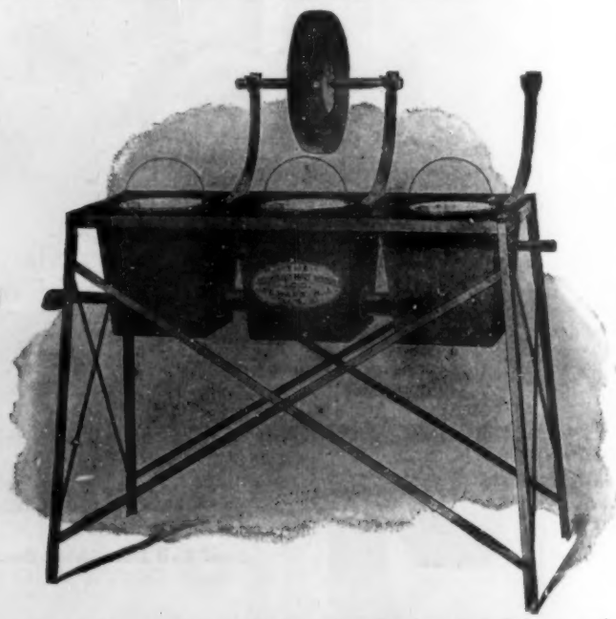
If you will send for our catalogue 21-M, a 276-page book of descriptions and illustrations and study its pages you will learn of many valuable specialties, in addition to our complete line of standard machinery and materials—specialties that will help you to save time and labor, aid in maintaining the efficiency of your plant and help to improve your process.

In electrical equipment the H. & V. W. line, from dynamos and motor generator sets to rod and wire connections, is the finest and most complete in the plating field.

Our very complete line of Polishing and Buffing Lathes of every type made with ball bearings or babbitted, motor or belt driven, will supply your every need.

Our Brush Manufacturing Department has been in operation over 25 years, and is the largest and best equipped factory of its kind. We make all kinds of brushes used by metal manufacturers, jewelers, silversmiths, watchmakers, and similar trades. Let us quote on your requirements in wire wheel, sectional and all kinds of hand brushes.

Ball-bearing and Babbitted Polishing Lathes of all types, Polishing and Buffing Heads, large and small; Belt Strappers, patented Countershafts.



No polishing room is modernly equipped unless it includes a good glue pot. This Steam Glue Heater is a good one, with automatic water supply.

Everything Large and Small for the

# THE HANSON &

ESTABLISHED

**Main Office and Factory:**

**New York Store, 81 Walker Street**

**San Francisco Agency,**

**Canadian, Hanson & Van Winkle Co., Limited,**

# to Reduce Polishing Grinding and Plating Costs

## labor-saving equipment means an appreciable increase in annual profits.

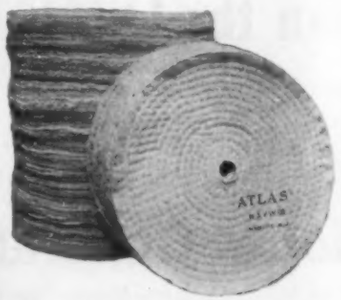
Before placing your next order for Buffs of any kind send for samples of our products. H. & V. W. have been making buffs as long or longer than any one in the field, and as is generally recognized throughout the trade we are in a logical position to give our customers the best buff value obtainable.

Our output of Polishing and Buffing Compositions is very large. Our products are preferred in many cases because of their unfailing efficiency and reliability, and also because the H. & V. W. mark on them is a guarantee of safety against inferior goods. In buying this class of material the guarantee of a reputable manufacturer is of inestimable importance.

Mechanical plating and galvanizing barrels, conveyor apparatus, and other special automatic machinery for handling and galvanizing unusual kinds of material, rods, pipes, wire and wire cloth and similar products, constitute an important branch of our business. Plans and equipment for complete automatic or semi-automatic plants for plating and galvanizing any kind of material are supplied and installed.

Visit our demonstration plant at Newark, N. J., and see "how we do it," and how you can get similar results in your own shop.

We have a complete stock of Tanned Bull-Necks, made especially for polishing wheels. We also carry oak-tanned leather for covering polishing wheels, which we can furnish in full sides or strips cut to size.




We furnish Buffs of every description, the very best goods at the lowest possible price considering their quality and that they are just as represented, full size, uniform material, full count, full weight.

Emery trays, a necessary adjunct to every well-equipped polishing room. Use one for each grade of emery and you will soon save enough material to pay for the trays.

The Universal Polishing Wheel can be used to advantage for practically all polishing operations where felt, canvas or bull-neck wheels are used.

For very fine polishing our process of making sheepskin wheels produces extreme durability. Being very pliable these wheels easily conform to irregular surfaces.

The compress wheel made in either leather or canvas. Gives twice the wear of ordinary polishing wheels.

Plating, Polishing and Galvanizing Shop

# VAN WINKLE CO.

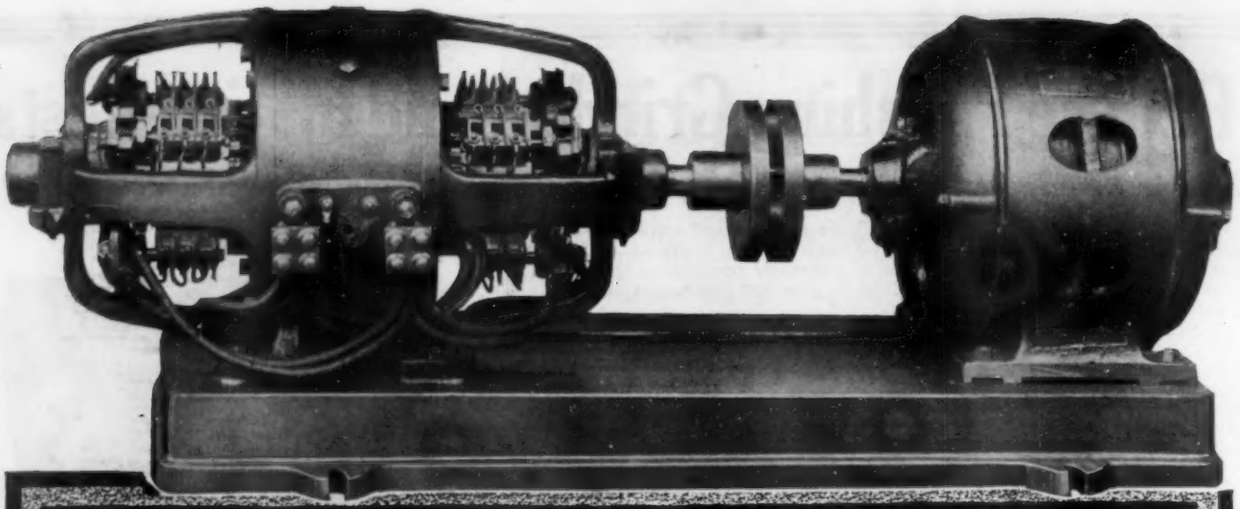
1820

**Newark, N. J., U. S. A.**

**Chicago, 842-846 West Erie Street**

**268 Market Street**

**Morrow Avenue, Toronto, Ont.**



# Can You Afford to Use a Less Efficient Generator Than the OPTIMUS?

The correct design, high grade materials and careful construction which are apparent in Optimus Motor Generator Sets insure highest efficiency with low operating cost and upkeep. They represent the most profitable investment it is possible to make in a plating generator.

## OPTIMUS Motor Generator Sets

They are simple in construction, easy of access, easy to understand, to clean and to inspect, and constant voltage is maintained, regardless of sudden variation of load. They will carry their full rated capacity continuously.

The brushes do not require frequent attention to keep them from wearing ridges in the commutator. The brush holders are self-aligning and sturdy, without many or clumsy parts.

The insulation is of such a character as to resist moisture and fumes and external grounds, and the perfect magnetic and electrical balance prevents pulsating currents within the armatures or cross currents between the ends of a double commutator machine.

Optimus Motor Generator Sets are the product of the highest engineering skill combined with a thorough, practical familiarity with plating requirements. Like all other Munning products, they are made in only one quality—the highest—and they sell at one price to all—the right one.

Munning Engineering Service will help you to decide just what type and capacity of generator will fit your requirements most efficiently and economically. Write us fully about your needs and our engineers will be glad to advise you.

## A. P. MUNNING & CO.

**Manufacturers of Electro-Plating and Buffing Apparatus and Supplies**

**Factories at NEWARK and MATAWAN, NEW JERSEY and CHICAGO**

**Offices in New York: Hudson Terminal, 50 Church Street**

Boston: Cutter & Wood Supply Co.
Chicago: 2920 Carroll Avenue.
Cleveland: 709 Marion Building
Detroit: 604 Free Press Building

Philadelphia: 447 Bourse Building
Rochester, N. Y.: 278 Post Avenue.
Springfield, Mass.: 43 Fort Pleasant Ave.

**AGENCIES**

Cutter & Wood Supply Co., Boston, Mass.; Geo. L. Claflin Co., Providence, R. I.; J. F. Quest & Bro., Minneapolis, Minn.; Berger & Carter Co., owners of Pacific Tool & Supply Co., San Francisco, Los Angeles, Portland, Ore., and Seattle, Wash.; Thompson-Munro-Robins, St. Louis, Mo., and Kansas City, Mo.

# The Hilo Salesman Renders Helpful Finishing Aid

A manufacturer of hospital furniture called in the Hilo Salesman to search out why they were obtaining a rough finish on their steel table legs. These legs were finished in White, one coat undercoat and one coat finishing enamel.

After studying the work, the Hilo Salesman reported to the Foreman Finisher:

> "This design of table leg is unsuited for dipping alone; when all coats are dipped the enamel does not fully cover the deep parts of the design, because in draining the material flows off onto the high spots.
>
> "Let us spray the first coat at 60 lbs. pressure to spread the material in every nook and corner; then the finishing coat can be applied by dipping."

Following these suggestions resulted in their obtaining a smooth uniform finish.

HILO

**Service Salesmen**

have solved many such problems. Manufacturers of castings, spun metal, etc., who have finishing troubles are invited to avail themselves of the Hilo Salesman's expert finishing knowledge and experience. A request to call will meet with a prompt response.

## Hilo Varnish Corporation

Formerly MOLLER & SCHUMANN CO.

1-3 Gerry St., BROOKLYN, N. Y. Chicago, Ill.

Pacific Coast Distributors:

THE BRININSTOOL CO., Los Angeles, Cal.

# MEAKERITE

## Will Put "PEP" In Your GALVANIZING SOLUTION

1. Plates Faster
2. Brightens Finish
3. Cleans Solution
4. Purifies Coating

Meakerite Speeds Production, as much as 100% for some users,—ask us what it will do for *your* plant.

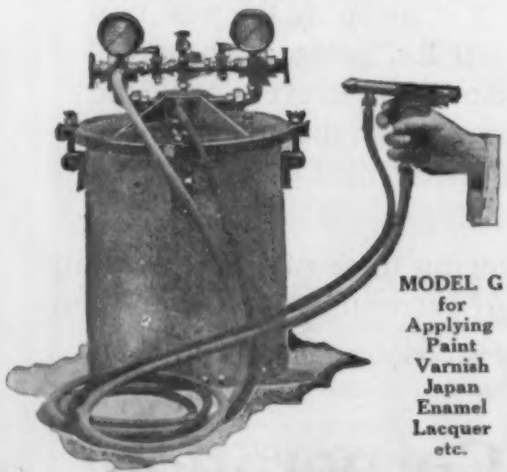
Meakerite is a new compound, carefully prepared and thoroughly tested. Simply add it to solution and continue to operate.

Write us now for information and booklet "Meakerite."

## Meaker Galvanizing Co.

1243-49 Fulton Street, Chicago, Ill.

**Profit by the Air Brush experiences of others and use the Eclipse.**



MODEL G for Applying Paint Varnish Japan Enamel Lacquer etc.

Anything which is "hand brushed" can be "Eclipse Air Brushed" with better results.

One Eclipse operator does as much work as 4 to 6 hand workers. The Eclipse Low Pressure (5 to 25 lbs.) Air Brush lays the material on as compounded. No chilling—No heating necessary.

Write for Booklet H.

**ECLIPSE AIR BRUSH COMPANY,**

79 Orange St. Newark, N. J.

**Amyl Acetate**
**Ethyl Acetate**
**Refined Fusel Oil**
**Leather Solutions**
**Thinners**
**Collodiums**

**Highest Quality, Service and Attractive Prices**

WRITE FOR SAMPLES

**Franco-American Chemical Works, Inc.**

CARLSTADT, N. J.

Pat'd March 22, 1902, Pat's Pending.

## THE EUREKA SPRAYER

Guaranteed Superior to All No Matter What You Pay

## THE ORIGINAL SPRAYER

Flattered by Imitations

Write for Catalog and Details

16 Years' Experience at Your Service

**Eureka Pneumatic Spray Co., Inc.** 62-64 Ninth Ave. New York

FRED'K CRANE CHEMICAL CO., Sole Agents for Great Britain, Birmingham, England.

# NIKOLAS C. E. 5 LACQUER

## THE WORLD'S STANDARD FOR THE LAST TWENTY-SEVEN YEARS

Acknowledged so by the trade in general

Because it is superior to all others for durability, finish and uniformity of quality.

For general utility it has no equal. It can be used with perfect satisfaction on all metals and nearly all finishes.

The C. E. 5 Lacquer being by far the best, it will yield the greatest returns because your finish will please your customers and insure repeat orders.

It pays to use the best lacquer because it is the most important and least expensive part of the finish.

You are in business to make money. You can not succeed with poorly finished goods because the people will not buy them if they can get a better finished article.

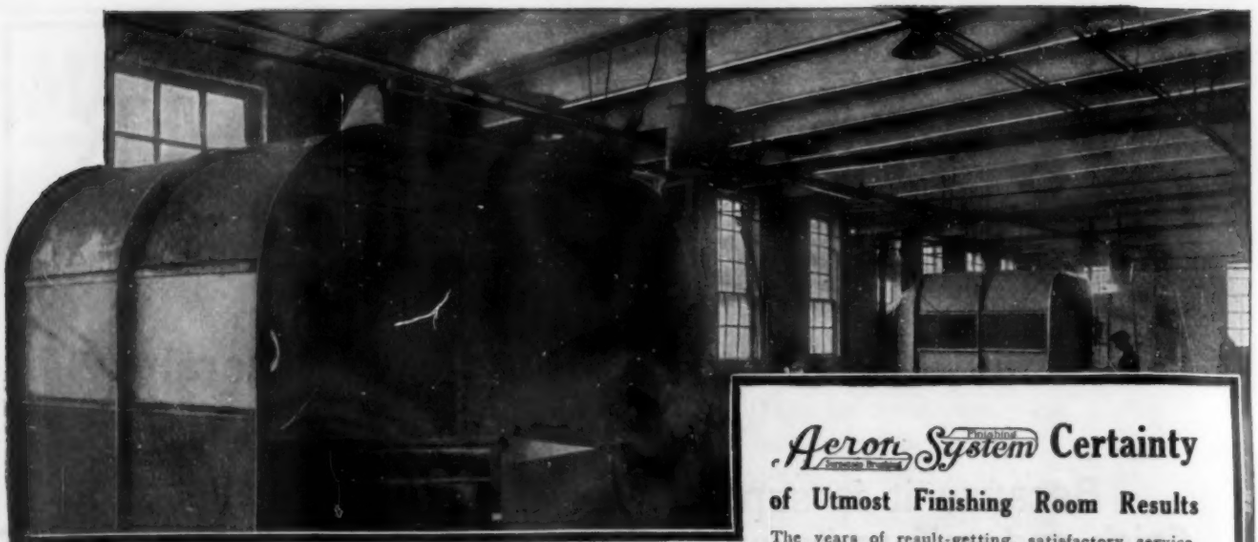
Send us your order now and put yourself on an equal basis with the firms in your line using the best lacquer made (The Nikolas C. E. 5).

MANUFACTURED BY

## G. J. NIKOLAS & COMPANY

77 BROADWAY
BROOKLYN, N. Y.

1227 W. VAN BUREN STREET
CHICAGO, ILL.



Aeron System Certainty

**of Utmost Finishing Room Results**

The years of result-getting, satisfactory service that the Aeron spray-finishing system has been rendering the wood- and metal-working industries, gives to each new installation of this equipment an assurance of the utmost in quality, speed and economy.

No matter what type, size or grade of product you manufacture, nor with what kind of finishing material you coat it—the Aeron System undoubtedly is now being used on work of the same or a similar character, and will be most certain to make it possible for you to do the highest grade of work at a big reduction in costs.

***Operation Facts***— One Aeron operator easily does the work of 2 to 6 or more hand brushers—governed by nature of work.
A cleaner and more uniform coating of every material is applied—there are no brush marks, thin spots or fatty edges.
Work is made absolutely healthful and safe—all fumes are completely removed.
Equipment is kept in the best working condition at practically no cost.
The Aeron System is sold on a strictly guaranteed basis, and every installation followed up by a competent service organization.

*Write and let us send on more definite particulars*

**The DeVilbiss Mfg. Co., 1305 Palmwood Avenue Toledo, Ohio**

"BUILT FOR SERVICE"

**PRACTICAL AIR SPRAYER No. 5 Price $9.00**

SIMPLE PRACTICAL
DURABLE ECONOMICAL

Applies paint, varnish, lacquer, enamel, bronzes, etc., at low pressure.
This Practical Air Sprayer has an air regulator.
Standard jar is used.
Circulars on request.
MANUFACTURED BY

**Economy Machine Products Co.**
FORMERLY ECONOMY MFG. CO.
**4755 London Ave., Chicago, Ill.**
SOLD BY ALL LEADING DEALERS

Pat. Jan. 4, 1916.

**The Crown Air Brush**

EXCELS in
Simplicity of operation
Stability of manufacture
This
with its interchangeable feature makes it worthy of your investigation.

WRITE FOR DESCRIPTIVE MATTER

MANUFACTURED BY

**B. E. HOLTON CO.**
1007 S. Figueroa St.
LOS ANGELES CAL.

# LACQUERS

## "QUALITY ACIDS AND CHEMICALS"

**Brimstone Sulphuric Acid, Nitric Acid, Muriatic Acid, Aqua Ammonia, Etc., Etc.**

**Have You Lacquer Troubles?**

Have you troubles with Arsenic and other impurities in Acids used in your dipping processes, etc., etc.? If you have WRITE US. We have the goods and the experts to cure them.

## THE KALBFLEISCH CORPORATION

**31 UNION SQUARE WEST NEW YORK**

Brooklyn, N. Y. Waterbury, Conn. Chattanooga, Tenn. Elizabethport, N. J.
Providence, R. I. Newark, N. J. Erie, Pa. Danbury, Conn.
Paterson, N. J.

# ZAPON Lacquer and Lacquer Enamel finishes are hard and durable

No matter how you test Zapon products you will be pleased with their wear-resisting qualities and all around endurance.

Apply them anywhere—they will add permanent beauty. The lacquers are clear and the Lacquer Enamels run the entire gamut of colors from the lightest tint to the darkest hue. If you need special finishes we make them.

Zapon products are applied economically by dipping and spraying. Either way they give the finish that sells your goods.

The men of the Zapon Service Division will lend their aid in finding the answer to your vexing finishing questions. They will also help you to reduce finishing costs and will speed production.

*Put your finishing problems up to us.*

CELLULOID ZAPON COMPANY
200 Fifth Avenue New York City

*Makers of Good Lacquers*

**ZAPON Lacquers and Enamels**

M.&W.Co 1876

# LACQUER
# LACQUER ENAMELS

**MAAS & WALDSTEIN CO.**

**92 WILLIAM STREET, NEW YORK**

**WORKS—NEWARK, N. J.**

You do not have to guess at the quality of your Lacquer if you use

**EGYPTIAN**

**THE EGYPTIAN LACQUER MFG. CO.**

**23 Liberty Street** "Makers of Quality Lacquers" **New York**

ADVERTISING

Is good only when superior Products are to be brought to your attention.

THAT IS WHY WE ADVERTISE

UNITED STATES LACQUER COMPANY RESISTOL

LACQUERS AND ENAMELS

Send for Samples
See for Yourself

Once Tried They Advertise Themselves

UNITED STATES LACQUER CO., 442 Driggs Ave., Brooklyn, N. Y.

DU PONT AMERICAN INDUSTRIES

Good Fixtures deserve Good Lacquers

A wall bracket by Mitchell-Vance finished with Du Pont Lacquers

E. I. DU PONT DE NEMOURS & COMPANY, INC.
SALES DEPARTMENT - CHEMICAL PRODUCTS DIVISION
WILMINGTON, DELAWARE

DU PONT

No question of their quality

.999 + FINE
SILVER
ANODES

Our reputation is stamped on every plate

HANDY & HARMAN

General Offices
59 Cedar St., New York City

Plants
Bridgeport, Conn.
29-31 Gold St., New York City

NEY'S
Precious Metal Products
"BEST SINCE 1812"

# HABIT

May be either good or bad. A bad habit is a serious drawback. A good habit becomes a barrier against evil. Firms as well as individuals acquire habits. The J. M. Ney Company long ago formed the habit of making only standard precious metal products. For 107 years we have been producing nothing but high-class materials. A habit of such long standing is firmly established.

## NEY'S SILVER SOLDERS ARE STANDARD

They have stood the test of time, and the demand for them is growing yearly. *"Best Since* 1812," they are commended by all high-grade metal workers.

**Information regarding grades and prices promptly supplied**

THE PIONEER
THE LATE
JOHN M. NEY

MANUFACTURED BY
*The* J. M. NEY COMPANY
FOUNDED IN 1812
President
HARTFORD, CONNECTICUT, U.S.A.

NEW GOLD FOR OLD GOLD SILVER PLATINUM ETC.

# Chain Draw Benches

**The machine illustrated herewith is one of our modern designs of Standard Chain Draw Benches, used for drawing tubes, rods, or special shapes of brass, aluminum, steel, or other metals that can be worked cold. This type of bench is at present carried in stock as shown for rod work, in two sizes having capacity of 10,000 and 20,000 pound chain pull, corresponding to our former sizes No. 1 and No. 2, chain benches.**

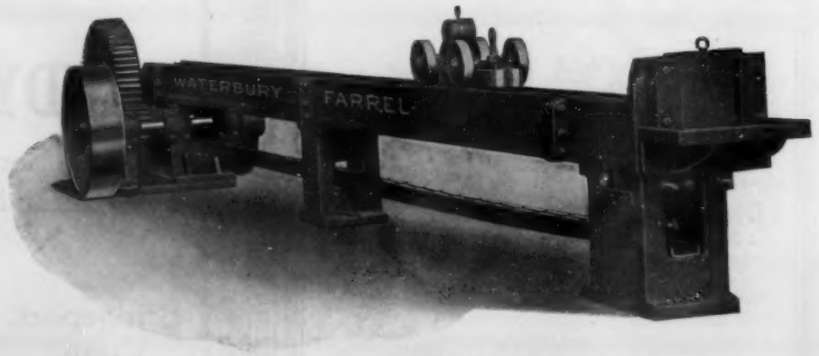
**These machines are adaptable for belting to a motor. They can be furnished with extensions for tube drawing with but slight delay. We can build similar machines in four smaller sizes and three larger sizes.**

**THE WATERBURY FARREL FOUNDRY & MACHINE CO.**
**WATERBURY, CONN., U. S. A.**

**Home Office and Works:**
465 Bank St., Waterbury, Conn.

**Western Office:**
1012 Williamson Bldg., Cleveland, O.

**FOREIGN AGENTS:**
GEO. H. ALEXANDER, Birmingham, England. For Rivet, Bolt and Nut Machinery, also Wire Machines.
FENWICK FRERES, Paris, France. For Rivet, Bolt and Nut Machinery.
D. WEIL, Paris, France. For Wire Machinery.




No. 2 Chain Draw Bench (4642) Without Extension

# Aluminum Company of America

General Sales Office, 2400 Oliver Building

Pittsburgh, Pa.

## Producers of Aluminum

Manufacturers of

Electrical Conductors for Industrial, Railway and Commercial Power Distribution

ALSO

Ingot, Sheet, Tubing, Rod, Rivets, Moulding, Extruded Shapes

ALSO

LITOT ALUMINUM SOLDERS AND FLUX

---

CANADA
Northern Aluminum Co., Ltd., Toronto

ENGLAND
Northern Aluminum Co., Ltd., London

LATIN AMERICA
Aluminum Co. of South America, Pittsburgh, Pa.

# PROGRESS

DURING THE WAR OUR LABORATORIES AND RESEARCH STAFF WERE INCREASED AND WE CO-OPERATED WITH ONE OF THE GREATEST NATIONAL LABORATORIES IN THE WORLD TO INVESTIGATE NEW PROBLEMS OF ALUMINIUM AND ITS ALLOYS.

YOU WILL PROFIT BY THIS ACTIVITY.

**The**
**British Aluminium Co., Ltd.**
OF LONDON, ENGLAND
165 Broadway New York City
265 Adelaide St. W., Toronto

## The Brass Ingot of YOUR CHOICE

**IN the selection of ingots, foundrymen choose LION BRAND Brass Ingots because the uniformity of high quality is safeguarded by our laboratory analysis. The reliability of Lion Brand Ingots will make you a constant user, once you test its adaptability and note the pleasing results.**

Our Commercial Red Ingot is Our Standard Red Metal—a worthy asset in the making of good castings.

**Write for Samples and Prices**

**THE LOEWENTHAL CO.**

CHICAGO 947 W. 20th St. | DETROIT 534 Lafayette Blvd. | BROOKLYN 23 Heyward St.

—INGOT—BILLET—
—FERRO—SHEET—
—POWDER—
# ALUMINUM
—WIRE—
—ROUND—FLAT—
—HALF-OVAL—SQUARE—

**LEYGRAND & CO., Inc.**
MILL AGENTS
**120 Broadway : : New York**

## W. H. KEMP CO.

Rollers and Manufacturers of

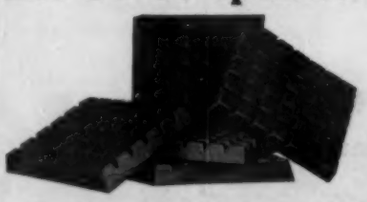
Pure Aluminum in Sheets and Foil to thinness of $\frac{1}{1000}$ of an inch. Aluminum in Ingots, Sheets, Rods, Wire and Tubing. Aluminum Solder and Rivets. Platers' Silver and Battery Plate 999 Fine. Platers' Brass, Oreide and German Silver.

**ALUMINUM LEAF AND POWDER FOR DECORATIVE PURPOSES**

Bronze Liquid for Mixing the Powder.
Send for Price List M I.

**165, 167 Spring St., N. W. cor. West Broadway**
**NEW YORK**

## Let Us Co-operate With You



You are anxious to turn out the very best castings possible and to do this you must have the best alloys. Damascus Alloys are guaranteed by the best guarantee—40 years' reputation as the standard of quality.

For better castings use Damascus Alloys—Phosphorized Copper, Phosphorized Tin, Silicon Copper, Manganese Copper, Phosphor Bronze Ingot.

**DAMASCUS BRONZE CO.**
Pittsburgh

**Cleveland Brass & Copper Mills, Inc.**
Main Office, Guardian Building
CLEVELAND, O.
**BRASS-BRONZE**
B. F. Brusstar, Gen. Manager
B. M. Gardner, Gen. Sales Agt.

# ALUMINUM

**Immediate shipment from N. Y. Stock in all commercial forms.**

**STRAHS ALUMINUM CO.,** 331 W. Broadway, cor. Grand St. **New York.**

New Jersey
zinc

*The world's standard for Zinc products*

# DISTRIBUTION

Manufacturing products exactly adapted to the needs of those who require zinc in manufacturing is one thing—a vital thing.

Distributing those goods so that they are easily accessible and quickly obtained in the quantities desired is another thing—equally vital.

There is not one industry using zinc that we cannot serve with zinc products of the character desired or one that we cannot readily supply through our widely and conveniently located warehouses.

## WAREHOUSES

| | |
|---|---|
| Brooklyn | Wallabout Basin Storage Co.<br>1208 Metz Street |
| Newark | Newark Storage Co.<br>Cor. Lawrence and Mechanic Sts. |
| Philadelphia | Terminal Warehouse & Transfer Co.<br>Delaware Avenue and Green Street |
| Pittsburgh | Central Warehouse Co.<br>Smithfield and Carson Sts. |
| Cleveland | Cleveland Storage Co.<br>Scranton Road |
| Chicago | Wakem & McLoughlin<br>140 South Dearborn Street |
| Los Angeles | Santa Fe Warehouse<br>300 Avery Street |
| San Francisco | The Haslett Warehouse Co.<br>228 Pine Street |

THE NEW JERSEY ZINC COMPANY, 160 Front St., New York

Established 1848

Chicago: Mineral Point Zinc Company, 1111 Marquette Building
Pittsburgh: The New Jersey Zinc Co. (of Pa.) 1439 Oliver Building

*Manufacturers of Zinc Oxide, Slab Zinc (Spelter), Spiegeleisen, Lithopone, Sulphuric Acid, Rolled Zinc Strips and Plates, Zinc Dust, Salt Cake and Zinc Chloride.*

# Announcing—

## OUR NEW DETROIT OFFICE

The growth of the Loewenthal Company business has necessitated the opening of an office in Detroit, Mich.

The management of this office will be under the care of Mr. Harry Goldberg, who will be in a position to render the same standard of service to our many customers in this new territory as Chicago or Brooklyn.

We suggest that you make a note of the location of our new office, which is 534 Lafayette Blvd., Telephone—West 364.

This expansion is notable inasmuch as it reflects the growth of our organization, which of course is due to the high standard of service rendered, together with the superior quality of the Lion Brand Ingots.

The *LOEWENTHAL* Co.

| CHICAGO | DETROIT | BROOKLYN |
|---|---|---|
| 847 W. 20th St. | 534 Lafayette St. | 23 Heyward St. |

# Michigan Smelting & Refining Company

Detroit, Michigan, U. S. A.

M S R TRADE MARK
MADE IN DETROIT
METALS

A highly developed scientific and technical industry for the production, reclamation, manufacture and sale of non-ferrous metals, specializing in the production of

**Standard Ingot Brass and Bronze, Bearing Metals, Solders, Lead Pipe, Brazing Spelter, Die Castings, etc., etc.**

Capacity 400 tons daily.

# WIZARD BRAND

phosphorized Bronze "can't be beat" for locomotive castings—automobile bearings—and other high grade bearings, where high speed and long life are required. It is particularly produced for particular manufacturers who demand "highest efficiency." Let us quote you prices. Produced and controlled by

**S. BIRKENSTEIN & SONS**
**383 W. ONTARIO STREET, CHICAGO**
**NEW YORK OFFICE, TIMES BLDG.**
**New Philadelphia Office, 134-136 Front St.**

# GIRARD

**SPELLS EFFICIENCY**

It represents the acme of perfection in

**INGOT BRASS**

Only a trial order can convince you of this fact.

WRITE US NOW!

**GIRARD SMELTING & REFINING CO.** Richmond & Tioga Sts., Philadelphia, Pa.

# Great Western Aluminum Ingot

PRODUCED UNDER DIRECT SUPERVISION OF OUR LABORATORY

## Guaranteed Uniformity of Grade and Quality

98-99% Aluminum Ingot
No. 12 Aluminum Ingot
Casting Alloy

carried in stock for prompt delivery.

Made in large bars weighing 40 to 45 pounds each, and small notched 6 to 7 pound bars.

*Send your inquiry for prices and other information to our nearest office.*

| | | |
|---|---|---|
| St. Louis | Chicago | New York |
| Detroit | Seattle | Vancouver, B.C. |
| Los Angeles | Cincinnati | San Francisco |
| Minneapolis | Cleveland | Denver |

**Great Western Smelting & Refining Co.**

# SILVEL

WHITE METALS

# ALWITE

## ALWITE

(Trade Mark Registered)

**The casting metal**

Alwite metal possesses qualities never before combined in one alloy. It was invented to meet the demand for a metal more satisfactory in quality and price than the nickel or bronze alloys, and it has successfully met all the tests of the trade. Its high white finish, secured by buffing alone, can never wear off. Nickel-plate must inevitably wear away and expose the unsightly base metal of the casting, but Alwite is solid in its whiteness. The surface is as permanent as the casting itself.

Alwite metal does not require any exceptionally skilful handling in its use, for it will follow every point of ordinary brass foundry practice.

USE ALWITE AND SAVE MONEY

**Silvel Metal Mfg. Co., Inc.**

Works: Farmingdale, Long Island, N. Y.
New York Office: 21 East 40th Street

We invite your inquiries on **ALUMINUM** in all commercial forms

We also carry a large stock of all other

## NON-FERROUS METALS

# U. S. REDUCTION CO.

CHICAGO Westminster Bldg.

General Offices and Works: East Chicago, Ind.

PITTSBURGH 2nd National Bank Bldg.

## Keep Your Bearings in Perfect Running Order

—By Using—

**A PERFECT BEARING METAL**

**FRICTIONLESS METAL COMPANY**

SOLE MANUFACTURERS

CHATTANOOGA, Tenn. RICHMOND, Va. MONTREAL, Can.

## North American Smelting Company

**PHILADELPHIA**

Phosphor Bronze — Anti-Acid Bronze
Climax Bronze — Manganese Bronze
Bronze and Brass Castings
Ingot Copper — Ingot Brass
Phosphor Copper — Phosphor Tin
Babbitt, Type, Linotype and Stereotype Metal
Tinners' and Brazing Solders
Lead and Block Tin Pipe

# Stanley Process PHOSPHOR-TIN

***Use old scrap or brass turnings,*** add about 2 lbs. of our Phosphor-tin to every hundred pounds of the brass, and you'll get as good a casting as if you used prime virgin metals.

***To make Phosphor Bronze*** use 85% Copper and 15% of Stanley Process Phosphor-tin; or use 85% Copper, 5% Lead and 10% Stanley Process Phosphor-tin.

Use about ½ to ¾ as much Stanley Process Phosphor-tin as you would ordinary tin in your mixtures and you will get equally good results.

**UNITED AMERICAN METALS CORP'N**

Syracuse Smelting Works, Subsidiary

BROOKLYN, N. Y.

Chicago, Ill.

## Special Deoxidized

COPPER-NICKEL ALLOYS
85/15%—75/25%—50/50%, or to your specifications

SPECIAL DEOXIDIZERS
for pure copper castings of high conductivity

SPECIAL TREATED COPPER
for deoxidizing Brass and Bronze Mixtures

SPECIAL COMPOSITIONS OF ALL KINDS
made to costumer's specifications

## Alloys & Products, Inc.

1448 West Farms Road New York City

## ROYAL PHOSPHOR COPPER

¶ Its world-wide reputation was earned by its reliability.

¶ Each shipment can be absolutely depended upon to be of the same composition as previous shipments. It is the same today as 10 years ago and there will be no change in it tomorrow, next day or next year.

¶ Used consistently it will do away with half your casting troubles.

¶ Made in two grades, guaranteed to contain 10% and 15% of Phosphorus—NO MORE, NO LESS.

**ROYAL MANGANESE COPPER**
**ROYAL SILICON COPPER**
**ROYAL PHOSPHOR TIN**
**METALLIC ARSENIC**

Send for Booklet M

## R. F. LANG

32 Broadway New York

# "Ingots"

write for
Ingot Catalog

We Make 3 Grades of

*Ingots*

"S M B"
"A M B"
"C"

American Manganese Bronze Co.,
Holmesburg, Pa.

# "Ingots"



## AJAX MANGANESE BRONZE

Is noted for its toughness and high tensile strength.

As a metal for many exacting uses it is little understood. Is not only confined to the production of noncorrosive castings, such as propeller wheels, but is now also extensively used in the manufacture of gas engine bases and crank cases, worms and gears, valve stems, lever arms, crank rods, and bridge bearings.

Get familiar with it by a trial order and you will be surprised how often you will find it greatly to your advantage to use it in place of gun metal and phosphor bronze.

*Booklet on Request.*

THE AJAX METAL COMPANY
Established 1880
Main Office and Works—Philadelphia, Pa.

New York Boston Chicago
Cleveland St. Louis
Washington San Francisco
Birmingham

## "C. C." Casting Copper

WORK with "C. C." Casting Copper, and you will understand how the half century's experience we put into the manufacture of this metal will guide you to *results*.

Your next order, for "C. C." Casting Copper, will convince.

We are manufacturers of the famous "Certificate" Metals.

Trade Mark Reg. U. S. Pat. Office.

WHITE & BRO., INC.
*Smelters and Refiners*
General Offices:
North American Bldg., Philadelphia



Phone Stuyvesant 2880

## Baltimore Copper Smelting & Rolling Co., Inc.

Branch Office and Warehouse
128-130 Fourth Avenue, New York City
(One block below Union Square)
Producers, Importers, Dealers, Jobbers

PIG LEAD INGOT COPPER
PIG TIN
ANTIMONY SPELTER
CADMIUM
SHOT NICKEL ALUMINUM
BISMUTH
COPPER SCALE ZINC DUST
COPPER SULPHATE
ZINC BOILER PLATES

Spot or Future Deliveries
One Pig to Carload
Also
Sheet Copper—Rolls—Anodes
Sawed Copper Bars
INQUIRIES SOLICITED

Elgin AMERICAN MFG.CO.

# ELGINITE METAL

Elgin AMERICAN MFG.CO.

A SPECIAL ALLOY FOR

## HIGH GRADE METAL PRODUCTS

Especially Adapted for Enameling Purposes
Takes an Exceptionally Fine Finish

We Specialize in **Rolled Sheet Metal** for products requiring Accuracy in Every Detail

**ROLLED BRASS AND NICKEL PLATERS' METAL**

**GOLD FILLED AND GOLD ROLLED STOCK FOR MANUFACTURING JEWELERS**

**Let us know your requirements and we will gladly submit estimates.**

Elgin AMERICAN MFG.CO.

**Elgin American Manufacturing Co.**
**Elgin, Illinois**

Elgin AMERICAN MFG.CO.

## PURE MANGANESE 93-95% and MANGANESE ALLOYS

**(Including 30% Manganese Copper, Manganese Titanium, Manganese Aluminum, and Manganese Boron)**

of various compositions, carbon free and technically free from iron and other impurities, in convenient size, used in the production of:

Brass and Bronze
Nickel Silver
Monel Metal
Nickel
Aluminum
Composition

Write for Metals Booklet No. 2058, which describes the uses of our Carbon-free Metals and Alloys.

THERMIT

**METAL & THERMIT CORPORATION**

120 BROADWAY NEW YORK CITY
7300 So. Chicago Ave., Chicago
329-333 Folsom St., San Francisco
1427-1429 Western Ave., Pittsburgh
15 Exilly St., Toronto, Canada

## THE STEINER SECTIONAL AND PORTABLE OVENS

**DIRECT OR INDIRECT HEATING**

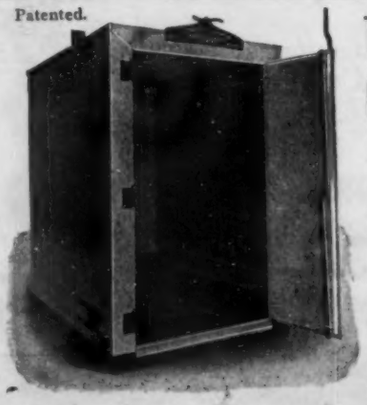
**Superior Construction, Economical Operation**
For Japanning, Lacquering, Drying and adaptable for many other purposes.

Drying Out Boxes

Send for Catalogue "M."

E. STEINER & CO., 20 Orange St., NEWARK, N. J.

Patented.



## THE GEHNRICH INDIRECT HEAT RADIATOR OVEN

Approved by the Board of Fire Underwriters

The greatest advance yet made in oven construction

USED FOR JAPANNING, LACQUERING, ENAMELING. OTHER OVENS FOR CORE BAKING, DRYING, TEMPERING, SHERARDIZING.

Send for Catalog "IM"

**Gehnrich Indirect Heat Oven Co., Inc.**

60 FRANKLIN AVE., BROOKLYN, N. Y.

Mueller Red Tip
*Brass and Copper*
Rod and Tubing

Forgings in
Brass, Bronze and
Aluminum

Castings in
Brass, Bronze and
Aluminum

Screw Machine
Products

Bushings, Bearings
Cored Bars

"MUELLER BRONZE FORGINGS BECAUSE OF THEIR SUPERIOR QUALITIES, SAVE TOOLS, TIME, AND MATERIAL."

NOTE – WE MAKE SCREW MACHINED PARTS FROM RED TIP ROD, AND TUBING, FORGINGS AND CASTINGS.

# MUELLER METALS CO.

Port Huron, Mich.

*Associated with*

H. Mueller Manufacturing Co.

*Decatur, Ill.*
*New York, N. Y.*
*Sarnia, Ont.*
*San Francisco, Calif.*

# Corrugated Sheets

UNEXCELLED for roofing and siding purposes—warehouses, elevator shafts, grain elevators, etc. They ensure moderate cost, long life, effective service, superior protection against fire and storm. Easily applied.

**Brass, Bronze and Copper**

in all forms, for Commercial, Architectural and Naval requirements. Sheets, Rods, Wire, Tubes, Rivets, Burs, Tacks, Nails, and other manufactured forms.

**Sheet Metals**

Large stocks available in our various warehouses—ready for shipment. Galvanized and Flat Black Sheets, Tin and Terne Plates, Corrugated Steel and Iron Roofing and Siding.

## MERCHANT & EVANS Co

NEW YORK PHILADELPHIA WHEELING
BALTIMORE CHICAGO
ATLANTA ST. LOUIS
CLEVELAND KANSAS CITY

EVERYTHING IN METALS

# FLUID COMPRESSED TUBING

**BRASS BRONZE GUN METAL**

**4' to 30' Diameter, any length**

**Write or wire for quotations**

## The Sandusky Foundry & Machine Co.

**SANDUSKY, OHIO**

ESTABLISHED 1859

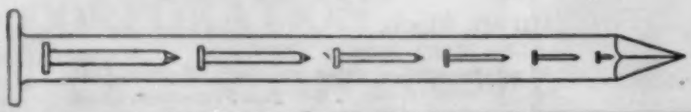
QUICK DELIVERIES

## JOHN HASSALL, INC.

CLAY & OAKLAND STREETS
BROOKLYN, N. Y.

RIVETS
ESCUTCHEON PINS
SPECIAL WIRE NAILS

IN ALL METALS



# FREDERICK T. HARRIS

SANDY HOOK, CONN., U. S. A.

## WIRE MANUFACTURER

| | | | |
|---|---|---|---|
| Gold | Phosphor Bronze | Pure Nickel | Steel |
| Silver | Silicon Bronze | Cupro Nickel | Iron |
| Aluminum | Common Bronze | German Silver | Brass |
| Monel | Manganin | Resistance | Special Metals |

**Wire for all purposes, including the following:**

| | | |
|---|---|---|
| Scratch Brushes | Hair Springs | Snap Fasteners |
| Fourdrinier Wire Cloths | Filters | Tinsel |
| Musical Strings | Sash Cord | Tiller Ropes |
| Electrical Instruments | Jewelry | Whips, Etc. |

Spooled, Coiled, Plated, Tinned, Galvanized, Flattened, Stranded, Tempered, Straightened and Cut.

# BRASS, BRONZE, NICKEL SILVER

## Exact Specifications

We like to work to exact specifications, chemical and physical, because our facilities for maintaining accuracy are exceptionally complete.

When you order raw materials from us you get the exact compositions specified—and, if you wish, our experience is at your disposal in determining the specifications.

**Scovill Manufacturing Company**

Established 1802

Waterbury, Connecticut

New York Philadelphia Cleveland Detroit
Rochester Boston Chicago

*More than a century of progressive experience is behind Scovill Service*

20

# WE SPECIALIZE IN THIN GAUGES

**RADIATOR AND SHIM BRASS**

Platers' Metal
Gilding
Phosphor Bronze
Squares

THIN SHEET METALS

Thin Brass, Copper
Bronze, Nickel Silver
Rerolling for the
Trade

**The Thin Sheet Metals Co., 126 Railroad Hill, Waterbury, Ct.**

# PURE SHEET NICKEL

***"THE ARISTOCRAT OF COMMERCIAL METALS"***

A pure, solid metal which, when polished, cannot be distinguished from sterling.

Particularly adapted for the manufacture of metal novelties, on account of its non-tarnishable features.

Let us send samples for trial purposes.

**DRIVER-HARRIS COMPANY**

CHICAGO
HARRISON, N.J.
WALKERVILLE, ONT. CANADA
MANCHESTER ENGLAND

The

# American Brass Company

Waterbury, Conn., U. S. A.

Manufacturers of

## BRASS, BRONZE, COPPER AND NICKEL SILVER

SHEETS, ROLLS, PLATES, WIRE and RODS—SEAMLESS and BRAZED TUBES—MOULDINGS, ANGLES and CHANNELS—CIRCLES, BLANKS and SHELLS

TOBIN BRONZE—EXTRUDED METAL—BENEDICT NICKEL—BARE AND INSULATED COPPER WIRE AND CABLES

MILLS AND FACTORIES

ANSONIA BRANCH, Ansonia, Conn.
BUFFALO BRANCH, Buffalo, N. Y.
KENOSHA BRANCH, Kenosha, Wis.
BENEDICT & BURNHAM BRANCH, Waterbury, Conn.
COE BRASS BRANCH, Torrington, Conn.
WATERBURY BRASS BRANCH, Waterbury, Conn.

OFFICES, STORES AND RESIDENT AGENTS

NEW YORK, N. Y., 195 Broadway
BOSTON, MASS., 172 High Street
PROVIDENCE, R. I., 131 Dorrance Street
CHICAGO, ILL., 29 East Madison Street
CINCINNATI, OHIO, 707 Traction Bldg.
CLEVELAND, OHIO, 912 Citizens Bldg.
PHILADELPHIA, PA., 1401 Widener Bldg.
PITTSBURGH, PA., 9 Union Bank Bldg.

## United States Smelting Refining & Mining Company

COPPER
D·R·W

ELECTROLYTIC LEAD
U·S·S·CO

Sales Office:
120 Broadway New York

Copper—Lead—White Arsenic—Cadmium—Selenium

STANDARD IRON PIPE SIZE
Brass & Copper

## TUBING

Regular & Extra Heavy in 12′ & 16′ lengths
(Stock Sizes for Immediate Shipment)

| | | | | |
|---|---|---|---|---|
| 1/8″ | 3/4″ | 2″ | 4″ | 7″ |
| 1/4″ | 1″ | 2 1/2″ | 4 1/2″ | 8″ |
| 3/8″ | 1 1/4″ | 3″ | 5″ | 9″ |
| 1/2″ | 1 1/2″ | 3 1/2″ | 6″ | 10″ |

ALSO

ROUND—BRASS ROD—HEXAGON

Stock — .187 to 1″ — Sizes

CHASE METAL WORKS
CHASE ROLLING MILL COMPANY

Trade BRASS Mark

ROD, WIRE, SHEET AND SEAMLESS TUBING FROM BRASS, COPPER, BRONZE, NICKEL-SILVER AND ALL COPPER ALLOYS

WATERBURY, CONNECTICUT

# DIRECTORY

## Copper, Brass and Other Metal Rolling Mills

### MANUFACTURERS OF PLATE, SHEET, ROD, WIRE, TUBE, INGOT, METAL GOODS

"Bridgeport"

**BRASS ROD** A free-cutting Brass Rod for screw machine work. It is straight and free from cracks.
Cuts easy—saves tools—greatly increases your production.

BRIDGEPORT BRASS COMPANY, Manufacturers
BRIDGEPORT, - - - - CONNECTICUT

---

**Sheet Brass Brass Rod Brass Wire**
**Nickel Silver Brazed Tubing**
**Extruded Metal Shapes**

THE BRISTOL BRASS CORPORATION
BRISTOL - CONNECTICUT
Organized 1850

---

TUBES
Copper
Brass

STANDARD
TUBES, RODS, WIRE

RODS
Copper
Brass
Bronze

WIRES—Copper, Brass, Bronze
Manufactured by
STANDARD UNDERGROUND CABLE CO.
Pittsburgh, Pa.
Boston, New York, Philadelphia, Chicago, St. Louis, San Francisco
For Canada: Standard Underground Cable Co. of Canada, Limited, Hamilton, Ont.

---

*Dallas Brass & Copper Co.*

SHEET
ROD
WIRE
TUBE

BRASS
COPPER

MILLS
Chicago
Buffalo
Waterbury
Baltimore

STOCK WAREHOUSE AND MAIN OFFICE
223-231 N. JEFFERSON STREET, CHICAGO, ILL.
Detroit, Mich., Office: 1440-1442 David Whitney Building

---

NEW JERSEY TUBE COMPANY
HARRISON, N. J.
Manufacturers of
ROLL AND SHEET BRASS
ROLL AND SHEET COPPER
BRASS AND COPPER TUBES
BRASS RODS

---

The Seymour Mfg. Co.
SEYMOUR, CONN.
Specializes in
**Nickel Silver**
**Pure Nickel** SHEET AND WIRE
NICKEL ANODES
PHOSPHOR BRONZE

---

NON-CORROSIVE FINEST QUALITY
**Copper and Yellow**
(MUNTZ) METAL
NAVAL BRASS
NAVAL BRONZE
MANGANESE BRONZE
PLATES, SHEETS, BOLTS, BARS, RODS, NAILS, TACKS, ETC.
Taunton - New Bedford Copper Co.
NEW BEDFORD, MASS.
35 Howard Street, New York
61 Batterymarch Street, Boston

---

**Winchester B & C Co.**
WINSTED, CONN.
Brass and Copper
coils or strips
Phosphor Bronze
Sawed Brass
Copper and Nickel
Anodes
Copper Foil

---

**The National Brass and Copper Company**
Manufacturers of
HIGH GRADE, CLEAN and BRIGHT
SHEET, PLATE and ROLL
**Copper**
ALL GAUGES and FINISHES
ASK FOR PRICES
QUICK SHIPPERS
LISBON - - OHIO

---

**Manhattan Brass Company**
332 East 28th St., NEW YORK CITY
Manufacturers of
BRASS and BRONZE in Sheets, Rod, Wire, Tube, Moulding, etc. METAL GOODS, made to order from Brass, Bronze and Copper.

# DIRECTORY

## Copper, Brass and Other Metal Rolling Mills

MANUFACTURERS OF PLATE, SHEET, ROD, WIRE, TUBE, INGOT, METAL GOODS


**C. G. Hussey & Co.**
PITTSBURGH, PENNA.
Manufacturers of
COPPER
IN SHEETS, PLATES, ROLLS
ANODES
TACKS AND NAILS

**Copper Rods**
Bare and Tinned Copper Wires
ROME WIRE CO.
ROME, N. Y.

**Rome Hollow Wire & Tube Company**
Main Office and Mill, ROME, N. Y.
Manufacturers of
SEAMLESS BRASS AND COPPER TUBING
Making a specialty of the smaller sizes and thin gauges

**Sheet Brass and Nickel Silver**
THE
DUEBER
WATCH CASE MFG. CO.
CANTON, OHIO U. S. A.

**Hendricks Brothers**
Manufacturers of
Sheet and Bar Copper
COPPER FIRE BOX PLATES and STAYBOLTS
WIRE AND BRAZIER'S RIVETS
Importers and Dealers in
INGOT COPPER, BLOCK TIN, SPELTER, LEAD, ANTIMONY BISMUTH, NICKEL, Etc.
49 Cliff Street New York

**H. K. & F. S. Benson**
GLEN RIDGE, N. J.
Brass, Nickel Silver and Copper
in Sheets and Rolls
LINING METAL
for Automobile Bearings
COPPER
for Electrical Purposes

**The National Company**
WATERBURY, CONN.
SEAMLESS TUBING
Brass, Copper, Bronze and Nickel
Small Sizes Our Specialty
*Branch Offices*
CHICAGO 80 E. Jackson Boulevard

**Frederick T. Harris**
SANDY HOOK, CONNECTICUT
Scratch Brush Wire
Drawing In Wire
Special Spring Wire
Resistance Wire
All Fine Sizes—All Metals
Round and Flat
We Specialize in Wire Which Was Formerly Imported

**Britannia Metal**
CASTING, ROLLING and REFINING FOR THE TRADE
Standard Rolling Mills Inc.
363 Hudson Avenue
BROOKLYN, N. Y.

For Space in this Directory address THE METAL INDUSTRY, 99 John Street, New York.

Sterling FIRELESS Silver
SILVER SOLDERS
John J. Jackson Company
157 Astor Street, Newark, N. J.

**COLD ROLLED ZINC**
IN COILS FOR
DRAWING and STAMPING
THE PLATT BROS. & CO.
WATERBURY, CT.

Send for a Copy of the New Edition of
Founders' Mixture and Finishers' Wrinkles
No Charge
THE METAL INDUSTRY 99 John Street, New York

# DIRECTORY

## Rolling Mill Sales Agents

### SELLERS OF PLATE, SHEET, ROD, WIRE, TUBE, INGOT, METAL GOODS

**Smith & McCrorken**
405 East 18th St.
New York City
Telephone 4624-2877 Gramercy
**ZINC**
Sheet Ribbon Strip Plate

For space in this directory, write The Metal Industry, 99 John St., New York.

**TRUMPBOUR-WHITEHEAD**
BRASS & COPPER CO.
INCORPORATED
Carry in stock, ready for use, all standard sizes
BRASS, COPPER AND NICKEL SILVER IN SHEETS, RODS, WIRE AND TUBES.
MONEL METAL
SHEET, ROD AND WIRE
Canal, Mercer & Howard Sts., New York
67 Washington Street
Boston, Mass.
43 North 7th Street
Philadelphia, Pa.

**Queen Brass & Copper Company, Inc.**
24 Stone Street, New York
ROLLING MILL PRODUCTS
BRASS, COPPER, ALUMINUM, NICKEL-SILVER
TUBES, WIRES, RODS, STRIPS, SHEETS

**BRASS ROD—ALL SIZES** Immediate Shipment From Stock
MIDWEST BRASS & COPPER CO., Inc.
6 CHURCH STREET, NEW YORK

Keep your name before the trade
ADVERTISE IN
The Metal Industry

# DIRECTORY

## Manufacturers of Plated Sheet Metals

### STEEL PLATES, SHEET ZINC, ETC., COATED WITH NICKEL, BRASS AND COPPER

**NATIONAL SHEET METAL COMPANY**
Manufacturers of NICOLENE, Brassene, Copperene and Bronzene Nickel Tin, Brass Tin, Bronze Tin, Copper Tin, Oxidized Copper Tin, Sheet Zinc, polished.
Large Saving to Manufacturers
Because plated sheets are much cheaper than solid brass or copper sheets, and no plating is required after the article is made up.
*Prompt deliveries*
For further information Address office, PERU, ILLINOIS

**NICKELOID**
NICKEL PLATED SHEET ZINC
Also
COPPEROID BRASSOID
NICKEL PLATED TIN
BRASS PLATED TIN
COPPER PLATED TIN
Can Be Stamped, Drawn and Soldered
WILL NOT RUST
Prompt delivery on stock size sheets
AMERICAN NICKELOID CO.
PERU - ILLINOIS
The first and largest mill in America to manufacture Plated Sheets.
R. Rothschild
Eastern Sales Agents
207 NORMAN AVE.
BROOKLYN

MANUFACTURERS USING SHEET METALS:
Save Money,
Secure Quicker Delivery of Materials,
Make a Superior Article
without adding to the cost. Write today for further information concerning APOLLO PLATED SHEET METALS, which, used as raw material, produce articles highly finished ready for the market without requiring any plating or polishing after assembling.
APOLLO METAL WORKS, LA SALLE, ILL.

For Advertising Rates and "ABC" Verified Circulation Report, Address, THE METAL INDUSTRY, 99 John Street, New York City

# DIRECTORY

## Lead and Zinc Smelters and Manufacturers

### PRODUCERS OF PIG LEAD, SLAB SPELTER, ZINC ROD, SHEET ZINC, ACIDS


**Illinois Zinc Company**
Manufacturers of
SPELTER, SHEET ZINC, and SULPHURIC ACID
PERU, ILL.

W. FISHER, Agent
280 Broadway
New York City
Telephone } Worth 1496 / Worth 1497

**THE HEGELER ZINC COMPANY**
DANVILLE, ILLINOIS

Smelters of
Slab Zinc
(Spelter)

Manufacturers of
Sulphuric Acid

**INTERNATIONAL LEAD REFINING COMPANY**

PIG LEAD

Refinery:
EAST CHICAGO, INDIANA

SALES AGENTS:
UNITED METALS SELLING CO.
42 Broadway New York

**AMERICAN ZINC, LEAD & SMELTING CO.**
PRODUCERS OF
"MASCOT" SPELTER
Suitable for Highest Grade Brass Work
Also INTERMEDIATE, BRASS SPECIAL and PRIME WESTERN
PIG LEAD and SULPHURIC ACID
Send All Inquiries to Sales Offices
EQUITABLE BUILDING - NEW YORK

**Matthiessen & Hegeler Zinc Co.** LA SALLE, ILL.
Manufacturers of
Sheet Zinc, Ribbon Zinc in Coils
AND SULPHURIC ACID
Smelters of ZINC Choice Brass Special
Sheet Zinc for drawn, spun and stamped ware manufacturers' purposes.
Special sizes to order, in squares, oblongs and discs.
Also Etchers', Engravers', Lithographers', Washboard Manufacturers' and Card and Paper Makers' sheets.
ROLLED ZINC PLATES FOR BOILER AND OTHER PURPOSES

**Granby Soft Missouri**
PIG LEAD
Wire your inquiries to
American Zinc, Lead & Smelting Company
1001 Pierce Building, St. Louis, Mo.

**ZINC ROOFING**
"OLD CHATEAU"
CORRUGATED AND V CRIMP
FLAT SHEETS AND RIDGE ROLL
(All Sizes)
THE AMERICAN ZINC PRODUCTS COMPANY
Greencastle, Ind.
Chicago Office, First Natl. Bk. Bldg. New York Office, 50 Church St.

Advertise your Products in **The Metal Industry**

# DIRECTORY

## Metal Smelters, Refiners, Dealers

### PRODUCERS, ALSO BUYERS AND SELLERS OF NEW AND OLD METALS

**Balbach Smelting & Refining Co.**
NEWARK, N. J.
PURCHASERS OF
COPPER BEARING MATERIAL
A superior market offered for all kinds of Residue and Scrap Materials containing copper in any form
LEAD BEARING MATERIAL
Battery Plates, Sediment, Sulphates, Drosses, etc.
(Cable Address "BALBACH")

**RED AND YELLOW INGOT BRASS**
WHIPPLE & CHOATE
429 Iranistan Ave., Bridgeport, Conn.

Established 1789
**NATHAN TROTTER & CO.**

| | | |
|---|---|---|
| Pig Tin | Shot Nickel | Ingot Copper |
| Pig Lead | Cube Nickel | Antimony |
| Spelter | Ingot Aluminum | Bismuth |

36 No. Front St.
PHILADELPHIA, PA.

**C. W. LEAVITT & CO.**
30 Church St., New York
ANTIMONY FERRO MANGANESE
ALUMINUM FERRO SILICON
and other Alloys

**Nassau Smelting & Refining Works**
607 West 29th St., New York
COPPER, SPELTER, LEAD, TIN, ALUMINUM, NICKEL ANTIMONY
Red and Yellow Composition Ingot Phosphor-Bronze Manganese-Bronze
BABBITT and TYPE METALS, SOLDERS
PURCHASERS AND REFINERS OF
TIN DROSSES, SCRUFF, MATTE, LEAD and TYPE DROSSES, METALLIC OXIDE, RESIDUES
AND ALL COPPER BEARING MATERIALS

**Columbia Smelting & Refining Works**
365 West Street, New York
METAL ALLOYS ACCORDING TO YOUR OWN FORMULAE
WHITE METALS A SPECIALTY
Tell us your wants or send us your samples for analysis. We will quote you most attractive Prices.
WE HAVE PERFECT FACILITIES FOR ANALYSES

**CAPPER PASS & SON, LD.**
BEDMINSTER SMELTING WORKS
BRISTOL, ENGLAND
Cable address—Pass, Bristol
*Are Buyers of*
Ores, Mattes, Drosses or Residues
Containing Tin, Copper, Lead and Antimony
*Send sample for analysis*

Established 1896
**V. HENNING & SONS**
The Quality House
General Offices: 332 Belmont Ave., BROOKLYN, N. Y. (Plant covers 31 City Lots)
MANUFACTURERS
Guaranteed Ingot Brass
DEALERS IN
VIRGIN METALS and SCRAP METALS

HIGHEST QUALITY **INGOT BRASS** MADE TO SPECIFICATIONS

| | | |
|---|---|---|
| PHOSPHOR COPPER | INGOT COPPER | SPELTER |
| PHOSPHOR TIN | PIG TIN | ANTIMONY |
| BABBITT | PIG LEAD | NICKEL |
| SOLDER | ALUMINUM | BISMUTH |

IMPORTED CRUCIBLES
Buyers of Copper Bearing Material
PAUL WENGER COMPANY
56 LIBERTY ST. PHONE RECTOR 5083 NEW YORK CITY

Use Lieber Code Cable Address: "SALIBMOERS"
**E. M. MOERS' SONS**
290 FRONT STREET
183 SOUTH STREET
NEW YORK, N. Y.
Dealers, Importers and Exporters of Scrap Metals and Specialists in
Monel and Nickel Scraps and Turnings
Liberty (German) Silver, Scrap and Turnings
SHOTTED NICKEL, ETC., ETC.
*Correspondence Solicited*

**RARE METALS**
NORTH ATLANTIC METAL CORPORATION
29 Broadway New York

SPOT, PROMPT, FUTURES
ANTIMONY
Ch., HERSCOPF & SON
Tel. W'msburg 1001 17 Walton St., Brooklyn, N. Y.

# DIRECTORY

## Metal Smelters, Refiners, Dealers

PRODUCERS, ALSO BUYERS AND SELLERS OF NEW AND OLD METALS


**TIN SUBSTITUTE**

REDUCES COST AND IMPROVES QUALITY

HAS BEEN USED FOR EIGHTEEN YEARS IN BRASS AND BRONZE MIXTURES

FOREIGN ORDERS MAY BE SENT DIRECT TO ANY REPUTABLE U. S. EXPORT COMPANY

New Era Mfg. Co., Inc. Kalamazoo, Mich., U. S. A.

**LEHMAN BROTHERS** SMELTERS AND REFINERS

**METALS**

Babbitt Metals, Bar and Wire Solder

Also Yellow and Composition Ingots to Specifications

4th and Jefferson Sts. Telephone Call Hoboken 1976-1977 Hoboken, N. J.

**SUPERIOR METAL CO., Inc.**

Member New York Metal Exchange L. J. L. RICH, Pres.

32 Broadway, New York 'Phone Broad 2140-1-2-3

YOUR INQUIRIES FOR

COPPER, ZINC, LEAD, SPELTER

ANTIMONY, ALUMINUM

PROMPTLY AND EFFICIENTLY HANDLED BY EXPERTS

Write for our METAL BOOKLET Our Connections are of the best

We Buy and Sell **METALS**

in Sheets, Strips and Circles

We are headquarters for

Black Iron, Steel and Tin Plate

Write us your requirements and offers

METAL PURCHASING CO., 63 Reade St.

NEW YORK

**CASH PAID FOR SECOND-HAND MATERIALS**

Platinum, Osmoiridium, Palladium, Silver, Quicksilver, Amalgams Bismuth, Cadmium, Magnesium, Gas Mantle Dust, Ores and Chemicals.

ALSO OLD C. H. MERCURY LAMPS, ETC.

JOSEF RADNAI 36 Fulton Street, New York City

**ELECTROLYTIC COPPER**

Orders executed on N. Y. Metal Exchange

Member N. Y. Metal Exchange — Broker LOUIS WEIL — 32 Broadway New York


# DIRECTORY

## Contract Workers

CASTING, STAMPING, SPINNING, PLATING, POLISHING, SPECIALTIES, ETC.


**Artistic Castings**

BRONZE - SILVER - GOLD

American Bronze Novelty Wks., Inc.

246 West 23rd St., New York, : Telephone "Chelsea 368"

Estimates Furnished

**Enameling, Stamping, Tools, Dies and Experimental Work**

Enameling & Stamping Corporation of N. Y.

2nd at Webster Aves.,

LONG ISLAND CITY, NEW YORK

# DIRECTORY

## Contract Workers

### CASTING, STAMPING, SPINNING, PLATING, POLISHING, SPECIALTIES, ETC.


**Automobile Brand and "Quality" Die CASTINGS**

CMF

*"Quality"* first, economy afterwards—but through the speedy efficiency of our plant we are constantly effecting economies.

Whether interested in our "Quality" Die-Castings or in our "Automobile Brand Castings" of Aluminum, Manganese Bronze, Red and Yellow Brass and Bearing Metals—

**Let Us Estimate**

**LIGHT MFG. & FOUNDRY CO.**
Pottstown, Pa., U.S.A.

**SHEET METAL STAMPINGS**

From material up to 7/8" thick

We are equipped to make the most difficult round, or irregular shaped parts in pressed metal, either large or small. We have the largest forming and drawing presses in the world, and a complete and modern plant for annealing, case hardening, nickel plating, electric and oxy-acetylene welding. Estimates cheerfully furnished on your sheet metal stamping requirements, heavy or light.

**The Bossert Corporation**
MAIN OFFICES AND WORKS, UTICA, N. Y.
Cleveland, Ohio, 611 Citizens Building
Detroit, Mich., 1513 Ford Bldg. New York City, 30 Church St.

ANDREW STENSON
**Artistic Metal Work**
FOR FURNITURE AND INTERIORS
French Hardware Memorial Tablets Mould Maker
Modeling Chasing
390 CANAL STREET Telephone Canal 9114 NEW YORK
Architects' Designs Carefully Executed

THIS SPACE FOR SALE

SEND FOR RATES


# DIRECTORY

## Laboratories and Professional Men

### ENGINEERS, CHEMISTS, METALLURGISTS


**THE S. H. THOMSON CHEMICAL LABORATORIES**
CHEMICAL TESTING AND RESEARCH
OFFICE AND LABORATORIES BEAVER POWER BUILDING Dept. "A" DAYTON, OHIO

**LEDOUX & COMPANY**
NEW YORK
Laboratory and Office: 99 John Street
Specialists in Analyses of Metals and Alloys

**NEW YORK TESTING LABORATORIES**
Mining, Metallurgical and Chemical Engineers
Specializing in Chemical and Physical analyses of Aluminum Alloys, Brasses and Bronzes, Babbitts, and all non-ferrous metals, irons and steels, ores, fuels, water, cement and asphalts.
Consultants, Investigators, Inspectors of Materials and Litigators in smelting, foundry and plating practices—metallurgical photomicrographs—
80 WASHINGTON ST., NEW YORK CITY

**John Boyle, Jr. PATENTS**
Attorney-at-Law
16 years in the examining corps of the U. S. Patent Office with special experience in chemical and metallurgical inventions and interferences.
Ouray Building Washington, D. C.

**RICKETTS & COMPANY, Inc.** 280 Madison Ave. New York
CHEMICAL, PHYSICAL AND MICROSCOPICAL TESTS
Analyses of Anodes, Metals, Alloys, Chemicals, Solutions and all Industrial Materials—Assays of Sweeps

**A Card Here Would Keep Your Name Before the Metal Trades at a Very Low Cost.**

MASK COMPLETE IN CASE, $20.00

# The La France-Yablick Mask

## The safe mask for smoke and fumes

In gas, smoke and ammonia the LaFrance-Yablick mask has been proved unusually efficient.

Our combination canister gives positive protection from smoke and gas, except carbon monoxide and illuminating gas. To meet unusual fume conditions we can furnish special canisters.

The mask is comfortable yet positively gas tight. The eye pieces are non-fogging, of laminated non-shatterable glass. The complete outfit is light in weight and easily and quickly put on.

AMERICAN-LAFRANCE FIRE ENGINE COMPANY, INC.

**Elmira, N. Y.**

New York Boston Philadelphia Washington Pittsburgh
Chicago Dallas Los Angeles San Francisco
Toronto, Ont.

# The Hygeia Safety First Products

**Respirators** **Gloves**
**Gas Masks** **Helmets**
**Goggles** **Safety Signs**
**Protective Wearing Apparels**

## RESPIRATORS

We wish to call particular attention to our Model "B-2" Respirator which is used as a dust-protector in the metal industry. PRICE $7.00 a dozen. Also to our Model "C" Hygeia Respirator which is a protector against fumes, gases, and smoke, and the finest dust. PRICE $12.00 a dozen.

## GOGGLES

The Hygeia Indestructo Goggle is absolutely non-scatterable and unbreakable, full cable temple is provided at side of lenses. PRICE $14.00 a dozen.

NOTE:—Our Motto is "Large Sales and Small Profits."
Respirators and Goggles are sent on approval.

**Send for Descriptive Circular and Price List**

**THE HYGEIA RESPIRATOR CO., INC. AND**
**THE HYGEIA SAFETY PRODUCTS COMPANY**

**31 E. 21ST STREET** **NEW YORK CITY**

## Steel-Grip Industrial Gloves and Mittens on Your Workers' Hands Will Put More Profits Into Yours.

Because your men will be more comfortable, feel safer and less hesitant about attacking a "mean" job; more like going at things with a will and getting them done quickly. Hundreds of big and little plants have been using **Steel-Grip Gloves and Mittens** profitably for years. Time for you to wake up!

No. 1050
Price $28.50
per dozen pairs

No. 640
Price $13.50
per dozen pairs

Over a dozen styles, for sandblasters, grinders, foundrymen, melters, scrap handlers and all other rough jobs.

No. 681
Price $13.50
per dozen pairs

Send a Trial Order and note the good results from their use.

**Hickory Steel-Grip Glove Co.**
Owned by Industrial Gloves Corporation
2345 W. Schubert St. CHICAGO, ILL.

# Seven Million Pounds Brass Rod

Free Cutting Stock

## For Immediate Shipment

Commercial Lengths
Absolutely New

## All Sizes

From 1/16" to 1 3/4"

## Price Much Below the Market

SUBJECT TO PRIOR SALE

TELEPHONE, WIRE or WRITE

**Aeronautical Equipment, Inc.**
33 West 42d Street New York City
PHONES Vanderbilt {8320 8344 4170} Murray Hill {1192 1193}

You Like to Know which of your ads pays best.

So does the other fellow!

When you answer his ad, tell him you saw it in The 'Metal Industry.

## The Only Respirator Approved By The Underwriters Laboratories

# Protect Your Workmen's Health

### Increase His Efficiency

The statistician's table of the Prudential Insurance Co. of America says that 58.6% of the men engaged in occupations exposed to METALLIC DUST—Grinders, Polishers, Cutlery, File and Tool Makers, Brass Molders and Finishers, Gold Beaters, Jewelers, Gold and Silver Polishers, Type Founders, Engravers, Printers and Pressmen—(ages 25 to 44) die from tuberculosis of the lungs and respiratory diseases, caused or aggravated by DUST.

The "DUSTITE" RESPIRATOR is simple, compact and comfortable to wear, and does not hinder the downward vision.

**Please bring this advertisement to the attention of the official whose duty it is to protect your workmen and increase their efficiency.**

## THE "DUSTITE" RESPIRATOR

**Per Dozen - - - $18.00**
**Less than Dozen, $2.00 Each**

***Sample Billed on Approval.***

## WALTER SODERLING, Inc.

345 West Broadway
New York

---

MARF N.Y.

## DIE CASTINGS

SPECIALISTS IN

**DIE CASTING MACHINERY AND DIES**

**MARF MACHINE CO., Inc.**
25 VANDEWATER ST., NEW YORK

---

# ACME-DIE

## ·CASTINGS·

ALUMINUM-ZINC-TIN & LEAD ALLOYS

**Acme Die-Casting Corp**
Boston Rochester Brooklyn N.Y. Detroit Chicago

---

# DOEHLER DIE-CASTINGS

stand for the utmost in QUALITY—and —what is of equal importance—a SERVICE which only an organization such as ours is equipped to render in this field.

Aluminum Die-Cast Magneto Frame

Die-castings in BRASS and BRONZE, Aluminum and White Metal Alloys.
Babbitt-Lined Bronze Bearings and Babbitt-Lined ALUMINUM Bearings.

## DOEHLER DIE-CASTING CO.

MAIN OFFICE AND EASTERN PLANT BROOKLYN, N.Y. WESTERN PLANT TOLEDO, OHIO.

SALES OFFICES IN ALL PRINCIPAL CITIES

# TRADE WANTS

## AN EXCHANGE FOR THE WANTS OF THE METAL AND PLATING TRADES

## ANSWERS SENT IN CARE OF THE METAL INDUSTRY WILL BE FORWARDED

## FOR SALE and WANTED—EQUIPMENT, ETC.

**Display Advertisements, One Column Wide, $3.00 per inch, Each Insertion.**

### Brazed Brass Tubing

WANTED—Several hundred lengths of Brazed Brass Tubing, 69 inches long, 1/32" wall, 1¾" O. D., also several hundred lengths 9 1/6" long, 1/32" walls, ⅞"O. D.

C. W. PARKER,
LEAVENWORTH, KANSAS.

### FOR SALE

SHEET METAL SCRAPER (FOR BRASS) NEW

Manufactured by Waterbury Farrel & Foundry Co., Waterbury, Conn.

Specifications:

| | |
|---|---|
| Length of table on top | 66" |
| Width of table on top | 31" |
| Stroke of scraping tool | 9" |
| Strokes per minute | 200 |
| Transverse motion of table | 30" |
| Longitudinal motion of table | 60" |
| Diameter of fly wheel | 22" |
| Face of fly wheel | 4½" |

With bronze gibs and with tight and loose pulleys.

Address your inquiries to:

R. POLIAKOFF,
711 Flatiron Building, New York City.

### BRASS MELTING FURNACES

FOR SALE—1 No. 1 32" Hawley Schwartz Down Draft Furnace-Class a-32. This furnace, which is lined, is complete with stand and the necessary fittings.

FOR SALE—1 No. 92 Monarch Engineering and Mfg. Co.'s Simplex furnace complete with ladle heater. These furnaces have been used less than one month. Will stand critical inspection. Both are available for immediate shipment and we offer same subject to prior sale.

MELTING FURNACES,
Care THE METAL INDUSTRY.

### METALS

FOR SALE—A few cars of SPEIGELEISEN guaranteed analysis below; 88-22% manganese, .05 carbon, .001 phos., .015 silicon; price $42.70 F. O. B. St. Louis, Mo.

400 tons GRADE-A SPELTER 99.90% F. O. B. Cleveland, Ohio, at nine cents per lb., material strictly free from cadmium—25 tons empty rifle shells made by the Winchester Arms of New Haven at 13¼c. per lb. delivered your city.

Zinc Boiler Plate—U. S. Navy Grade, 12x6x1 inch and 12x6x½. Price F. O. B. N. Y. Points, 11½c. lb.
Items are all a cash proposition.

M. WEILL,
Kinzie and Peoria Sts., Chicago, Ill.

### MELTING FURNACE

FOR SALE—Two Rockwell tilting reverberatory brass melting furnaces, 1000 lb. capacity.

L. LAPAT CO.,
Paterson, N. J.

### BRASS FURNACE

WANTED—Brass Furnace—capacity 1,000 lbs. to 1,500 lbs. State make, type, kind of fuel, length of service, condition and best price.

S-5,
Care THE METAL INDUSTRY.

### BRASS OVALS

FOR SALE—About 8,000 lbs. Brass Ovals 11" x 5½-¼ hard brass .017 thick, 30-70, new clean stock. Samples on application.

A. S. CAMPBELL CO.,
276 Commercial Street, Boston, Mass.

### PLATING DYNAMOS

WANTED—Cash paid for Plating Dynamos any size, give complete description, make, capacity, and condition.

ROSE ELECTRIC CO.,
6401 State St., Chicago, Ill.

### ROLLING MILL

WANTED—ROLLING MILL, new or second-hand, wanted. To be used for breaking down heavy metal-rolls not less than 14" diameter. Send full description and quote best price and delivery.

THE H. A. WILSON CO.,
97 Chestnut St., Newark, N. J.

### PLATING DYNAMO

FOR SALE—2500 Amperes, 8 Volt, 750 R. P. M. with Rheostat and Pulley, built by Connecticut Dynamo and Motor Co., practically new, guaranteed in fine condition.

OSBORNE & SEXTON MCHY. CO.,
Columbus, Ohio.

### OPPORTUNITY

FOR SALE—Small soft metal casting and plating business. Gas furnace, band saw, buffers, lathe, air pumps, spray, 4 lg acid copper tanks, nickel, brass all lead lined, iron cyanide, 2-16 ft. tanks for steel rolls, 3 motors, 4 generators, orders for several weeks, good prospects. Owner has another business demanding all his time. Address

NATIONAL COPPER WORKS, 10 Thatcher St., Boston, Mass.

### PLATING BARREL

FOR SALE—One (1) U. S. Junior Plating Barrel; also one (1) Model 10 Type "D" Mechanical Plater, Bakelite. Both the above machines are practically new, not having been used above half a dozen times. Reasonable price for quick sale.

LUFKIN RULE CO.,
Saginaw, Mich.

# TRADE WANTS

## AN EXCHANGE FOR THE WANTS OF THE METAL AND PLATING TRADES

## ANSWERS SENT IN CARE OF THE METAL INDUSTRY WILL BE FORWARDED

## FOR SALE and WANTED—EQUIPMENT, ETC.—Continued

**Display Advertisements, One Column Wide, $3.00 Per Inch, Each Insertion**

### PATENT FOR SALE

Patented Metallic Alloy. Can be used as a metallic packing or brake shoe lining. Good opportunity for progressive manufacturer. Address

PATENT,
Care THE METAL INDUSTRY.

### POLISHING ROOM FOREMAN

WANTED—Man experienced in the handling of work requiring grinding, roughing, finishing and buffing. Will have charge of about sixty men, with a fast growing concern. Please give name, address and state salary expected in answering. Address

POLISHING ROOM FOREMAN,
Care THE METAL INDUSTRY.

### CONCENTRATING TABLE

FOR SALE—One Wilfley Laboratory concentrating table, suitable for brass foundry, practically new, cheap.

LEITELT BROS.,
7725-7735 So. Chicago Ave., Chicago, Ill.

Second hand polishing lathes and used rag wheels for sale cheap.
WALSH'S SONS & CO.,
Newark, N. J.

### SPACE FOR SALE

## SITUATIONS OPEN

**Display Advertisements, One Column Wide, $3.00 per inch, Each Insertion.**

### ROLLING MILL SUPERINTENDENT

WANTED—A foreman and working superintendent for small rolling mill. Must be familiar with modern rolling mill practice and have the ability to successfully superintend a small rolling mill with four rolls. Must have experience in and be capable of producing work of very high quality and finish. This position would be steady and offers the opportunity of being an important one in our organization involving excellent prospects of advancement. State wages, references, age and experience. Address

ADVANCEMENT,
Care THE METAL INDUSTRY.

### SALESMEN WANTED

Men willing to be trained to handle unusual sales problems. Practical chemists, paint and varnish men, wood finishers, electroplaters or men having practical knowledge of other fine finishes, will be considered and given such training as to form a part of the oldest and best sales and service organization in its particular field. Several men are wanted for big cities and outside territories. Straight salary and every assistance to make good. We want high grade men. Reply in strictest confidence, telling past experience, present occupation, age, nationality and salary desired. Address

EXECUTIVE,
28 S. Grove St., East Orange, N. J.

### FOREMAN PLATER-POLISHER

WANTED—Foreman for polishing and plating department in a factory located in Michigan. We desire a foreman who has had a broad experience of not less than 10 years in this class of work and who has been successful and can furnish references that will stand thorough investigation. In answering give salary expected, all places employed during the last ten years, nature of the position, name of the company and the active head of the company at that time. Also give height and weight and all other information that would enable us to form an opinion as to the ability of the applicant. Address

MICHIGAN,
Care THE METAL INDUSTRY.

### FOREMAN PLATER

WANTED—Foreman Plater by a metal goods and novelty manufacturing concern, located in Newark, N. J.

Must be a man with broad experience, of at least ten years, on gold silver and bronze finishes; also on nickel and brass plating. One who is willing to work and can handle help successfully. Only one who can furnish first-class references as to character and ability which will bear thorough investigation will be considered. In answering, state age, nationality, salary expected, places employed during the past ten years, nature of position held and how long in each case. We have a modern plant, ideally located and believe an excellent opportunity to right man. Address:

NEWARK,
Care THE METAL INDUSTRY.

### FOREMAN

WANTED—First-class foreman who understands the manufacture of Yellow and Red Ingots and Aluminum Ingots.

RED INGOTS,
Care THE METAL INDUSTRY.

### FOREMAN PLATER

SITUATION WANTED—Good executive desires position with growing concern. Ten years' experience in job shop and factory lines, present employers have discontinued plating department. Can furnish best of references.

GOOD EXECUTIVE, Care THE METAL INDUSTRY.

### PRODUCTION SUPERINTENDENT

WANTED—A high grade Production Superintendent who is thoroughly up to date in modern shop practice and who is a real practical mechanic; one who could, if necessary, do the work of any man under him in brass finishing, tool and pattern making and who thoroughly understands modern foundry work. This position is with a young, fast growing factory, and it will be in a short time the most important from money and influence standpoint. PRODUCTION SUPERINTENDENT, Care THE METAL INDUSTRY.

### BRASS FINISHER

WANTED—Brass Finisher as working foreman. One who is thoroughly conversant with the manufacture of plumbers' supplies and can design and make own tools and equipment for quantity production. Steady position and good opportunity for right party.

W. A. MILLS BRASS CO.,
Port Chester, N. Y. N. Y. Office, 103 Park Ave.

# TRADE·WANTS

## AN EXCHANGE FOR THE WANTS OF THE METAL AND PLATING TRADES

## ANSWERS SENT IN CARE OF THE METAL INDUSTRY WILL BE FORWARDED

## SITUATIONS OPEN—Continued

**Display Advertisements, One Column Wide, $3 per inch, Each Insertion**

### COPPER ROLLER

WANTED—OPPORTUNITY FOR MAN experienced in copper rolling work. Very good permanent position will be given to a person who answers our qualifications. Reply, giving in detail experience, age, salary expected, etc. Address:

COPPER ROLLER,
Care THE METAL INDUSTRY.

### DRUMMER

WANTED—We have an opening for a man to solicit work for job-shops.

Exceptionally good opportunity for a live wire.

VICTORY PLATING AND POLISHING CO.,
94 Spencer St., Brooklyn, N. Y.

## SITUATIONS WANTED

**Display Advertisements, One Column Wide, $1 per inch, Each Insertion**

### BRASS FOUNDRY FOREMAN

SITUATION WANTED—A brass foundry foreman with a total of eighteen years of experience on brass and aluminum castings, including twelve years as a moulder and three years as a core maker, desires new connections.

Is thoroughly experienced in mixing metals, has operated almost every type of oil and gas furnace, and is capable of breaking in new help on all branches of foundry work.

At present is employed as a general foundry foreman but prefer to be brass foundry foreman.

If you are interested write

GENERAL FOREMAN,
Care THE METAL INDUSTRY.

### FOREMAN JAPANNER-ENAMELER

SITUATION WANTED—As Foreman Japanner and Enameler. Has had 9 years' experience in japanning, enameling, stripping, lettering, dipping and spraying. A1 reference. Western part of New York or middle West preferred.

OGT-6,
Care THE METAL INDUSTRY.

### FOREMAN PLATER

SITUATION WANTED—First class practical and reliable plater desires to make a change on or after January first with a reliable firm. Satisfaction guaranteed. Locality New York or vicinity. Address

A-1 PLATER,
Care THE METAL INDUSTRY.

### SUPERINTENDENT

SITUATION WANTED—Brass Foundry Superintendent who is thoroughly posted on up-to-date foundry practice; large or small castings, any class of metal, or can take charge of refining plant refining all kinds of white metal drosses or foundry residues. Steam goods preferred. Address

M. B.,
Care THE METAL INDUSTRY.

### PLATER

SITUATION WANTED—Foreman Plater desires to make a change and would like to connect with a reliable firm where the services of a competent man are indispensable. Expert on all solutions and capable of maintaining normal conditions economically. Familiar with all popular and special finishes, all modern methods in connection with polishing, lacquering and barrel plating. Capable of installing plants. Can furnish A-1 references. Address P. H., Care THE METAL INDUSTRY.

### ELECTRO-PLATERS

Anyone desiring the services of first class men for the electro-deposition of metals and finishing in all branches and departments of the plating business can secure such services by corresponding with the Secretary of the American Electro-Platers Society.

JOHN E. STERLING,
473 10th Ave., Long Island City, N. Y.

### FOREMAN PLATER

WANTED—Foreman to take charge of large Plating Department. One who understands still tank, machine and barrel plating. Must also be familiar with chemical or pigment finishes. State age, experience and wages expected. Address

HARDWARE,
Care THE METAL INDUSTRY.

### ETCHER

SITUATION WANTED—By an expert etcher, who thoroughly understands the best and up-to-date methods. Can teach any branch of the art in a few days' time and supply all formulas, etc. Address

SIMPLE METHODS,
Care THE METAL INDUSTRY.

FOR SPACE IN THIS DIRECTORY

Address

THE METAL INDUSTRY

99 JOHN STREET NEW YORK CITY

## INQUIRIES AND OPPORTUNITIES

**The following inquiries for Metals, Machinery and Supplies have been received. Names of inquirers may be obtained from The Metal Industry, 99 John St., New York, N. Y.**

Inquiry 2423—I am making a study of the plating business preparatory to setting up a plant in Philadelphia. Please send books on the subject.

Inquiry 2424—We are about to install a nickel plating plant. Please send sample copy of THE METAL INDUSTRY.

Inquiry 2425—We will manufacture automobile bodies, fenders, hoods, radiator shells, tanks, skylights, ventilators, conveyor and ventilation pipe and other sheet metal products of 10 gage steel and lighter, and want catalogs of machinery. Our power is electric shaft drive.

Inquiry 2426—Please advise where we can purchase 22, 24, 28, 30 and 32 gage aluminum suitable for making name plates.

Inquiry 2427—Who manufactures the Jones & Thwait oil burner?

Inquiry 2428—Where can I secure metal molds for casting aluminum ornaments for automobiles from my own designs?

Inquiry 2429—Who makes filter presses for collecting residue from washed tanks?

Inquiry 2430—Where can I secure gilted steel wire rings? Also nickeled, polished or galvanized rings, preferably made to open about ¾" diameter so that they will slip together to make up a chain?

Inquiry 2431—Where can we get small ornaments in filigree work molded of soft metal?

Inquiry 2432—Where can we buy a polishing machine for sheet copper? Also equipment for tinning sheet copper?

Inquiry 2433—It is my intention to install a small plating plant for nickel, copper and zinc coating. Please send instructions.

Inquiry 2434—We want addresses of concerns making brass tube bending machines that will bend tubing from ⅜" to 1" in diameter.

# For Sale and Want Ads

If you have a want of any kind for the coming year, we can fill it for you through our Annual Review (January) Number, which will be given an enlarged circulation.

**RATES—For Sale and Wants, $3.00 per inch per insertion.**

**Situations Wanted, $1.00 per inch per insertion.**

---

**Mail Copy to reach us on or before January 10th**

---

The Metal Industry
99 John Street
New York

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

**ABRASIVES** (Also see Emery.)
Artificial
Niagara Emery Mills, New York.
Norton Co., Worcester, Mass.
Stevens, Frederic B., Detroit, Mich.

**ACID-PROOF STONEWARE** (See Acid Pumps; Dipping Baskets.)

**ACID PUMPS, STONEWARE**
General Ceramics Co., New York.

**ACIDS**
Celluloid Zapon Co., New York.
Kalbfleisch Corporation, New York.
Hydrofluoric
General Chemical Co., Philadelphia, Pa.
Hydrochloric, (Muriatic.)
Nitric (Aqua Fortis.)
Kalbfleisch Corporation, New York.
Oil of Vitriol (Sulphuric.)
Celluloid Zapon Co., New York.
Hegeler Zinc Co., Danville, Ill.
Kalbfleisch Corporation, New York.
New Jersey Zinc Co., New York.

**ACCUMULATORS, HYDRAULIC** (also see Hydraulic Machinery.)
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Watson-Stillman Co., New York.

**AIR BRUSHES AND ACCESSORIES** (See Sprayers; Spraying Accessories.)

**AIR COMPRESSORS** (Also see Centrifugal Air and Gas Compressors.)
DeVilbiss Mfg. Co., Toledo, O.
Eclipse Air Brush Co., Newark, N. J.
Eureka Pneumatic Spray Co., New York.
Leiman Bros., New York.
New Haven Sand Blast Co., New Haven, Conn.
Nikolas, G. J., Co., Chicago, Ill.
Pangborn Corporation, Hagerstown, Md.

**AIR FILTERS** (See Filters.)

**AIR TANKS**
Nikolas, G. J., Co., Chicago, Ill.

**AIR AND GAS PRE-MIXING BURNERS** (See Burners.)

**AEROPLANE DOPE**
Celluloid Zapon Co., New York.
Nikolas, G. J., Co., Chicago, Ill.

**ALLOYS** (See Kind Wanted.)

**ALUMINUM** (See Angles and Channels; Castings; Die Castings; Electrical Conductors; Fluxes; Forgings; Granulated Metals; Ingots; Leaf and Foil; Machined Products; Match Plates; Moldings and Extruded Shapes; Pipe; Powder; Rods and Bars; Sheets; Solder; Strip Metal; Tubes; Wire, Etc.)

**ALUMINUM ALLOYS**
Aluminum Co. of America, Pittsburgh, Pa.
American Boron Products Co., Reading, Pa.
American Magnesium Corporation, Niagara Falls, N. Y.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Great Western Smelting & Refining Co., St. Louis, Mo.

**AMMETERS** (See also Electrical Apparatus and Equipment.)
Bolsaier Electric Co., New York.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Crown Rheostat & Supply Co., Chicago, Ill.
Eager Electric Co., Watertown, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Munning, A. P., & Co., New York-Chicago.
Weston Electrical Instrument Co., Newark, N. J.

**AMMONIUM CHLORIDE**
Roessler & Hasslacher Chemical Co., New York.

**AMYL ACETATE**
Maas & Waldstein Co., New York.
Nikolas, G. J., Co., Chicago, Ill.
Franco-American Chemical Co., Carlstadt, N. J.

**ANGLES AND CHANNELS, ALUMINUM**
Aluminum Co., of America, Pittsburgh, Pa.

**ANNEALING FURNACES**
Electric
Booth Electric Furnace Co., Chicago, Ill.
Detroit Electric Furnace Co., Detroit, Mich.
Electric Furnace Co., Alliance, Ohio.
Oil or Gas
Kenworthy, Chas. F., Waterbury, Conn.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Rockwell, W. S., Co., New York.
Surface Combustion Co., New York.

**ANNEALING MUFFLES**

**ANODES**
Brass and Bronze
Apothecaries Hall Co., Waterbury, Conn.
Bennett-O'Connell Co., Chicago, Ill.
Bolsaier Electric Co., New York.
General Platers' Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
L'Hommedieu, Chas. F., & Sons., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
Stevens, Frederic B., Detroit, Mich.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Copper
Bolsaier Electric Co., New York.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Hussey, C. G., & Co., Pittsburgh Pa.
Munning, A. P., & Co., New York-Chicago.
Stevens, F. B., Detroit, Mich.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Warren Products Co., New York.
Electrolytic Copper
Bolsaier Electric Co., New York.
Gold
Handy & Harman, New York.
Ney, J. M., & Co., Hartford, Conn.
Nickel
Apothecaries Hall Co., Waterbury, Conn.
Bennett-O'Connell Co., Chicago, Ill.
Bolsaier Electric Co., New York.
Ely, C. Upham, New York.
General Platers' Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
L'Hommedieu, Chas. F., Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Warren Products Co., New York.
Platinum
Handy & Harman, New York.
Ney, J. M., & Co., Hartford, Conn.
Roessler & Hasslacher Chemical Co., New York.
Silver
Handy & Harman, New York.
Jackson, John J., Co., Newark, N. J.
Ney, J. M., & Co., Hartford, Conn.
Zinc
Galvanizing Corporation of America, Brooklyn, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, O.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New Jersey Zinc Co., New York.

**ANTI-FRICTION METAL** (Also see Babbit Metal, and Bearings.)
Union Smelting & Refining Co., Inc., Newark, N. J.

**ASPHALTUM**
Asphaltum & Chemical Products Co., New York.

**ASSAYERS AND CHEMISTS** (Also see Testing Laboratories.)
Ledoux & Co., New York.
New York Testing Laboratories, New York.
Ricketts & Co., Inc., New York.
Thomson, S. H., Chemical Laboratories, Dayton, O.

**ANTIMONY METAL**
Leavitt, C. W., & Co., New York.

**AUTOMATIC MACHINERY** (See Agitating, Cleaning & Plating Machines; Bolt Heading, Trimming & Threading Machines; Cock Grinders; Cutting, Straightening and Forming Machines; Drying-out Machines; Dipping Baskets; Drop Lifters; Pickling Machines; Plating Barrels; Plating Machines; Buffing Machines.)

**AUTOMATIC WIRE AND SHEET METAL WORKING MACHINERY.**
Baird Machine Co., Bridgeport, Conn.

**AUTOMOBILE FORGINGS** (Also See Forgings.)
American Manganese Bronze Co., Holmesburg, Philadelphia, Pa.

**BABBITT METAL** (See also Bearings.)
Ajax Metal Co., Philadelphia, Pa.
American Manganese Bronze Co., Holmesburg, Philadelphia, Pa.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Frictionless Metal Co., Chattanooga, Tenn.
Merchant & Evans Co., Philadelphia, Pa.
Michigan Smelting & Refining Co., Detroit, Mich.
Richards & Co., Boston, Mass.
Union Smelting & Refining Co., Inc., Newark, N. J.
United American Metals Corporation, Brooklyn, N. Y.
U. S. Reduction Co., Chicago, Ill.

**BABBITT MOLDS** (See Molds.)

**BALL BURNISHING EQUIPMENT** (Also see Burnishing and Polishing Barrels.)
Abbott Ball Co., Hartford, Conn.
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.

**BALLS, STEEL** (See Steel Balls.)

**BARS; SILVER, GOLD, PLATINUM.**
Handy & Harman, New York.

**BEARINGS** (Also see Babbitt Metal and Anti-Friction Metal.)
Babbitt
Ajax Metal Co., Philadelphia, Pa.
Frictionless Metal Co., Chattanooga, Tenn.

**BLOWERS AND BLOW PIPING** (See also Exhaust Fans and Heads.)
Astle, H. J., & Co., Providence, R. I.
Cleveland Blow Pipe & Mfg. Co., Cleveland, O.
Leiman Bros., New York.
Monarch Engineering & Mfg. Co., Baltimore, Md.
New Haven Sand Blast Co., New Haven, Conn.

**BOILER INSULATION** (See Brick, Insulating; Insulation, Boiler; Insulating Cement.)

**BOILER SETTINGS** (See Fire Cement.)

**BOLT HEADING, TRIMMING AND THREADING MACHINES**
Webster & Perks Tool Co., Springfield, O.

**BORONIC ALLOYS**
American Boron Products Co., Reading, Pa.

**BOTTOM PLATES, STEEL**
Wadsworth Core Machine & Equipment Co., Akron, O.

**BRASS** (See Brass Mill Products; Wire Mill Products; Anodes; Briquet Ingots; Castings; Die Castings; Discs and Cups; Forgings; Ingots; Moldings and Extruded Shapes; Rods and Bars; Sheets; Strip Metal; Tubes; Wire.)

**BRASS FOUNDERS** (See Castings.)

**BRASS FOUNDRY EQUIPMENT & SUPPLIES** (See Kind Wanted.)

**BRASS MILL ENGINEERS** (See Engineers.)

**BRASS MILL MACHINERY** (Also See Kind Wanted.)
Garrison, A., Foundry Co., Pittsburgh, Pa.
Torrington Manufacturing Co., Torrington, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Wolffgram, L., Erie, Pa.

**BRASS; SHEET WIRE, ROD, TUBE** (Also See Wire Mill Products; Rods and Bars; Sheets; Strip Metals; Tubes; Wire; Etc.)
American Brass Company, Waterbury, Conn.
Benson, H. K. & F. S., Glen Ridge, N. J.
Bridgeport Brass Co., Bridgeport, Conn.
Bristol Brass Co., Bristol, Conn.
Chase Metal Works, Waterbury, Conn.
Cleveland Brass & Copper Mills, Inc., Cleveland, O.
Dallas Brass & Copper Co., Chicago, Ill.
Dueber Watch Case Mfg. Co., Canton, O.
Elgin-American Mfg. Co., Elgin, Ill.
Hendricks Bros., New York.
Manhattan Brass Co., New York.
Midwest Brass & Copper Co., New York.
New Jersey Tube Co., Harrison, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Seymour Mfg. Co., Seymour, Conn.
Taunton-New Bedford Copper Co., Taunton, Mass.
Thinsheet Metals Co., Waterbury, Conn.
Trumpbour-Whitehead Brass & Copper Co., New York.
Winchester B. & C. Co., Winsted, Conn.

**BRASS MILL SALES AGENTS**
Aeronautical Equipment, Inc., New York.
Trumpbour-Whitehead Brass & Copper Co., New York.

**BRASS MOLDERS FLASKS** (See Flasks.)

**BRASS WORKING LATHES** (See Lathes.)

**BRAZING SOLDER** (See Solder.)

**BRICK** (Also See Fire Brick.)
Cork Paving
Armstrong Cork and Insulation Co., Pittsburgh, Pa.
Insulating
Armstrong Cork and Insulation Co., Pittsburgh, Pa.
Quigley Furnace Specialties Co., New York.

**BRIQUETTING BRASS CHIPS, Etc.**
General Briquetting Co., New York.

**BRIQUETTING MACHINES**
General Briquetting Co., New York.

**BRITANNIA METAL**
Standard Rolling Mills, Inc., Brooklyn, N. Y.

**BRONZE** (See Anodes; Castings; die Castings; Forgings; Ingots; Powder; Rods and Bars; Tubes; Etc.)

**BRONZING LIQUID**
Celluloid Zapon Co., New York.
Nikolas, G. J., Co., Chicago, Ill.

**BRUSHES**
Hand
Blumenthal, H. & Co., New York.
Cleveland Osborn Mfg. Co., Cleveland, Ohio.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
Nikolas, G. J., Co., Chicago, Ill.
New York Buff Co., New York.
Paxson, J. W., Co., Philadelphia, Pa.
Sectional Wheel
Cleveland Osborn Mfg. Co., Cleveland, Ohio.
Wheel
Blumenthal, H., & Co., New York.
Cleveland Osborn Mfg. Co., Cleveland, Ohio.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.

**BUFFING CAKE, PLATINUM** (Also See Buffing and Polishing Compositions.)
Matchless Metal Polish Co., Glen Ridge, N. J.
Munning, A. P., & Co., New York-Chicago.

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

**BUFFING MACHINES, AUTOMATIC** (Also see Polishing Lathes and Heads.)
Divine Bros. Co., Utica, N. Y.

**BUFFING AND POLISHING COMPOSITIONS**
Apothecaries Hall Co., Waterbury, Conn.
Bennett-O'Connell Co., Chicago, Ill.
Bennett & Seeley, Bridgeport, Conn.
Burns, E. Reed, Supply Co., Brooklyn, N. Y.
General Platers Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Matchless Metal Polish Co., Glen Ridge, N. J.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
Stevens, Frederic B., Detroit, Mich.
Warren Products Co., New York.
Wiarda, John C., & Co., Brooklyn, N. Y.
Woodison, E. J., Co., Detroit, Mich.

**BUFFING AND POLISHING WHEELS** (Also See Buffs.)
Canvas, Cotton, Etc.
Bennett-O'Connell Co., Chicago, Ill.
Bennett & Seeley, Bridgeport, Conn.
Divine Bros. Co., Utica, N. Y.
Eastern Felt Co., Winchester, Mass.
General Platers Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
Warren Products Co., New York.
Woodison, E. J., Co., Detroit, Mich.
Felt
Bacon Felt Co., Winchester, Mass.
Divine Bros. Co., Utica, N. Y.
Eastern Felt Co., Winchester, Mass.
Hanson & Van Winkle Co., Newark, N. J.
Leather
Divine Bros. Co., Utica, N. Y.

**SHEEPSKIN**
Yorkville Mfg. Co., Brooklyn, N. Y.

**BUFFS** (Also See Buffing and Polishing Wheels.)
Bennett-O'Connell Co., Chicago, Ill.
Bennett & Seeley, Bridgeport, Conn.
Burns, E. Reed, Supply Co., Brooklyn, N. Y.
Divine Bros. Co., Utica, N. Y.
General Platers' Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
Warren Products Co., New York.

**BUILDING PAINT SPRAYERS**
DeVilbiss Mfg. Co., Toledo, O.

**BURNERS** (Also See Furnaces.)
Air and Gas Pre-Mixing
Buckeye Products Co., Cincinnati, Ohio.
Maxon Premix Burner Co., Muncie, Ind.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Oil or Gas
Buckeye Products Co., Cincinnati, Ohio.
Gehnrich Indirect Heat Oven Co., Brooklyn, N. Y.
Hausfeld Co., Harrison, O.
Hawley Down-Draft Furnace Co., Easton, Pa.
Improved Appliance Co., Brooklyn, N. Y.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Surface Combustion Co., New York.

**BURNISHING AND POLISHING BARRELS**
Abbott Ball Co., Hartford, Conn.
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, O.
Hanson & Van Winkle Co., Newark, N. J.
Henderson Bros. Co., Waterbury, Conn.
Munning, A. P., & Co., New York-Chicago.
No-Dust-Drying Machine Co., Providence, R. I.
Smith-Richardson Co., Attleboro, Mass.

**BURNISHING COMPOUNDS AND CHIPS** (Also See Soap.)
Abbott Ball Co., Hartford, Conn.
International Chemical Co., Camden, N. J.

**BURNISHNG MATERAL**
No-Dust-Drying Machine Co., Providence, R. I.

**CABBAGING PRESSES** (See Presses; Scrap Baling Machines.)

**CALCIUM-COPPER** (See Also Ingots.)
American Magnesium Corporation, Niagara Falls, N. Y.

**CANVAS WHEELS** (See Buffing and Polishing Wheels.)

**CASE HADENING MATERIALS**
Buchanan, C. G., Chemical Co., Cincinnati, O.

**CASTING METAL**
Union Smelting & Refining Co., Inc., Newark, N. J.

**CASTINGS**
Aluminum
Aluminum Company of America, Pittsburgh, Pa.
Light Mfg. & Foundry Co., Pottstown, Pa.
Mueller Metals Co., Port Huron, Mich.
Brass, Bronze and Composition
American Bronze Novelty Works, New York.
American Manganese Bronze Co., Holmesburg, Philadelphia, Pa.
Mueller Metals Co., Port Huron, Mich.
Copper
Mueller Metals Co., Port Huron, Mich.
Die
Acme Die Casting Corporation, Brooklyn, N. Y.
Mueller Metals Co., Port Huron, Mich.
Iron, Malleable
Malleable Iron Fittings Co., Branford, Conn.
Nickel-Silver
Mueller Metals Co., Port Huron, Mich.
Nichrome
Driver-Harris Co., Harrison, N. J.
Silvel Metal
Silvel Metal Mfg. Co., New York.
Silver
American Bronze Novelty Works, New York.
Zinc
New Jersey Zinc Co., New York.

**CAUSTICIZED ASH**
Solvay Process Co., Syracuse, N. Y.

**CAUSTIC POTASH.**
Penn Chemical Works, Philadelphia, Pa.

**CAUSTIC SODA**
Penn Chemical Works, Philadelphia, Pa.
Roessler & Hasslacher Chemical Co., New York.
Solvay Process Co., Syracuse, N. Y.

**CEMENT** (See Fire Cement; Insulating Cement.)

**CENTRIFUGAL AIR & GAS COMPRESSORS**
General Electric Co., Schenectady, N. Y.

**CENTRIFUGAL DRYERS AND EXTRACTORS** (Also See Drying-Out Machines.)
No-Dust Drying Machine Co., Providence, R. I.
Tolhurst Machine Works, Troy, N. Y.

**CHEMICALS, DEALERS IN ALL KINDS** (Also See Kind Wanted.)
Cooper, Chas. & Co., New York.

**CHEMISTS, CONSULTING** (See Assayers and Chemists; Testing Laboratories.)

**CHLORIDE OF IRON**
Roessler & Hasslacher Chemical Co., New York.

**CHUCKS, SPINNING, ROUND & OVAL**
Pryibil, P., Machine Co., New York.

**CINDER CRUSHERS** (See Crushers and Pulverizers; Reclaiming Machinery.)

**CLEANERS, METAL, WASTE, GENERAL**
Oakley Chemical Co., New York.

**CLEANING APPARATUS, AUTOMATIC METAL** (Also See Pickling Machines.)
Crescent Washing Machine Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

**CLEANING COMPOUNDS** (See also Fig Cleanser; Pickling Compounds, Whale Oil Soaps.)
Metal
Anthony, H. M., Co., New York.
Apothecaries Hall Co., Waterbury, Conn.
Bennett-O'Connell Co., Chicago, Ill.
Daylight Clean-All Co., New York.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Ford, J. B., Co., Wyandotte, Mich.
Fuller, W. A., Co., Greenburg, Pa.
General Platers Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
International Chemical Co., Camden, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
Oakley Chemical Co., New York.
Solvay Process Co., Syracuse, N. Y.
Stevens, Frederic B., Detroit, Mich.
Window
Daylight Clean-All Co., New York.

**COCK GRINDERS, AUTOMATIC**
Turner Machine Co., Philadelphia, Pa.

**COMPOSITION METAL** (See Castings; Ingot; Etc.)

**COMPOSITIONS** (See Buffing and Polishing Compositions; Flooring Compositions.)

**COMPOUNDS, CUTTING AND GRINDING, DRAWING, STAMPING**
Oakley Chemical Co., New York.

**COMPRESSORS, AIR & GAS** (See Air Compressors.)

**CONCENTRATING TABLES** (Also see Reclaiming Machinery.)
Hardinge Conical Mill Co., New York.
James Ore Concentrating Co., Newark, N. J.

**CONTRACT WORK** (See Castings; Die-Castings; Dies; Electro-Galvanizing; Electro-Plating; Forgings; Hot Galvanizing and Tinning; Plating; Barrel Method; Polishing and Burnishing; Etc.)

**COPPER** (Also See Anodes; Castings; Ingots; Rods and Bars; Sheets; Smelters and Refiners; Strip Metal; Tubes; Wire; Etc.)
Electrolytic
U. S. Smelting, Refining & Mining Co., New York.
Casting.
White & Bro., Inc., Philadelphia, Pa.
Sheet, Wire, Rod, Tube
American Brass Co., Waterbury, Conn.

**COPPER-ALUMINUM, BORONIC**
American Boron Products Co., Reading, Pa.

**COPPER BEARING MATERIAL, BUYERS OF** (Also see Drosses, Residues, Etc.)
White & Bro., Inc., Philadelphia, Pa.

**COPPER, BORONIC**
American Boron Products Co., Reading, Pa.

**COPPER, CARBONATE OF**
Asphaltum & Chemical Products Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Munning, A. P., & Co., New York-Chicago.
Wiarda, John C., & Co., Brooklyn, N. Y.

**COPPER-CLAD WIRE, ROD, Etc.** (See Wire.)

**COPPER-CYANIDE**
Celluloid Zapon Co., New York.
Roessler & Hasslacher Chemical Co., New York.

**COPPER-NICKEL, BORONIC**
American Boron Products Co., Reading, Pa.

**CORE MACHINES**
American Foundry Equipment Co., Chicago, Ill.
Stevens, Frederic B., Detroit, Mich.
Wadsworth Core Machine & Equipment Co., Akron, O.

**CORE OILS AND COMPOUNDS**
Buckeye Products Co., Cincinnati, Ohio.
Stevens, Frederic B., Detroit, Mich.

**CORE OVEN INSULATION** (See Brick, Insulating; Insulating Cement; Insulation, Oven.)

**CORE OVENS**
Coal and Coke
Buckeye Products Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Obermayer, S., Co., Pittsburgh, Pa.
Steiner, E., & Co., Newark, N. J.
Stevens, Frederic B., Detroit, Mich.
Wadsworth Core Machine & Equipment Co., Akron, O.
Woodison, E. J., Co., Detroit, Mich.
Electric
General Electric Co., Schenectady, N. Y.
Oil and Gas
Buckeye Products Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Obermayer, S., Co., Pittsburgh, Pa.
Stevens, Frederic B., Detroit, Mich.
Wadsworth Core Machine & Equipment Co., Akron, O.
Woodison, E. J., Co., Detroit, Mich.

**CORE TRAYS, STEEL**
Wadsworth Core Machine & Equipment Co., Akron, O.

**COUNTERSHAFTS, BALL BEARING**
Gardner Machine Co., Beloit, Wis.

**CHANES, HAND, POWER AND ELECTRIC TRAVELING**
Northern Engineering Works, Detroit, Mich.

**CRUCIBLES, GRAPHITE**
Bartley, Jonathan, Crucible Co., Trenton, N. J.
Dixon, Joseph, Crucible Co., Jersey City, N. J.
Foreign Crucibles Corporation, Ltd., New York.
Gautier, J. H. & Co., Jersey City, N. J.
General Platers Supply Co., New York.
McCullough-Dalzell Crucible Co., Pittsburgh, Pa.
Seidel, R. B., Inc., Philadelphia, Pa.
Stevens, Frederic B., Detroit, Mich.
Taylor, Robt. J., Inc., Philadelphia, Pa.
Vesuvius Crucible Co., Swissvale, Pa.
Warren Products Co., New York.

**CRUCIBLES TONGS** (See Tongs.)

**CRUSHERS AND PULVERIZERS** (See Also Reclaiming Machinery.)
Eastern Machinery Co., New Haven, Conn.
Hardinge Conical Mill Co., New York.
James Ore Concentrating Co., Newark, N. J.
Sly, W. W., Mfg. Co., Cleveland, O.
Standard Equipment Co., New Haven, Conn.

**COUPLES**
Dixon, Joseph, Crucible Co., Jersey City, N. J.

**CUPRO-NICKEL** (See Brass Mill Products.)

**CUTTING, STRAIGHTENING & FORMING MACHINERY**
Wire
Baird Machine Co., Bridgeport, Conn.
Shuster, F. B., Co., New Haven, Conn.
Strip Metal
Baird Machine Co., Bridgeport, Conn.
Bliss, E. W., Co., Brooklyn, N. Y.
Shuster, F. B., Co., New Haven, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

**CYANIDE** (See Copper Cyanide; Silver Cyanide; Cyanide; Sodium Cyanide; Zinc Cyanide.)

**DEOXIDIZERS, METAL** (See Fluxes.)

**DIE CASTING MACHINERY AND MOLDS**
Marf Machine Co., New York.

**DIE CASTING METAL**
Union Smelting & Refining Co., Inc., Newark, N. J.

**DIE-CASTING** (Also See Sastings, Die.)
Aluminum
Aluminum Co. of America, Pittsburgh, Pa.
Mueller Metals Co., Port Huron, Mich.
Brass and Bronze
Doehler Die Casting Corporation, Brooklyn, N. Y.
White Metal
Acme Die Casting Corporation, Brooklyn, N. Y.
Doehler Die Casting Corporation, Brooklyn, N. Y.
Light Mfg. & Foundry Co., Pottstown, Pa.
Marf Machine Co., New York.
Mueller Metals Co., Port Huron, Mich.

**DIES, SHEET METAL WORKING**
Bliss, E. W., Co., Brooklyn, N. Y.

**DIPPING BASKETS**
Automatic
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Heat-Resisting
Driver-Harris Co., Harrison, N. J.
Stoneware

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

General Ceramics Co., New York.
Munning, A. P., & Co., New York-Chicago.

**Wire**

Hanson & Van Winkle Co., Newark, N. J.
Munning, A. P., & Co., New York-Chicago.
Smith, John P., & Co., New Haven, Conn.

**DRAW BENCHES, WIRE ROD, TUBE**

Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Watson-Stillman Co., New York.
Wolffgram, L., Erie, Pa.

**DRAWING AND STAMPING (See Metal Goods Made to Order; Stamping and Drawing.)**

**DRINKING WATER SUPPLY SYSTEMS**

Armstrong Cork & Insulation Co., Pittsburgh, Pa.

**DROP HAMMERS**

Bliss, E. W., Co., Brooklyn, N. Y.

**DROP LIFTERS (See also Presses, Drop Lifters for.)**

**Automatic**

Miner & Peck Mfg. Co., New Haven, Conn.

**DROSSES, RESIDUES, ETC., BUYERS OF (Also See Metal Dealers, Old.)**

Balbach Smelting & Refining Co., Newark, N. J.
Capper, Pass & Son, Ltd., Bristol, England.
Herscopf, Ch., & Son, Brooklyn, N. Y.
Nassau Smelting & Refining Co., New York.
Loewenthal Co., Chicago, Ill.

**DRYERS (See Centrifugal Dryers; Ovens; Drying-Out Machines; Ladle Heaters and Dryers; Mold Dryers; Sand Dryers; Sawdust Drying-Out Boxes.)**

**DRYING-OUT MACHINES (See Also Centrifugal Dryers and Extractors; Sawdust Drying-Out Boxes.)**

Baird Machine Co., Bridgeport, Conn.
Smith-Richardson Co., Attleboro, Mass.

**Automatic**

Astle, H. J., & Co., Providence, R. I.
No-Dust-Drying Machine Co., Providence, R. I.
Tolhurst Machine Works, Troy, N. Y.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

**DUST COLLECTORS AND VENTILATING SYSTEMS (Also See Exhaust Fans and Heads.)**

Allington & Curtis Mfg. Co., Saginaw, Mich.
Astle, H. J., & Co., Providence, R. I.
Cleveland Blow Pipe & Mfg. Co., Cleveland, O.
Kirk & Blum Co., Cincinnati, O.
Leiman Bros., New York.
No-Dust-Drying Machine Co., Providence, R. I.

**DUST PROTECTORS**

Hygeia Respirator Co., Queens, New York.
Soderling, Walter, New York.

**DYNAMOS, LOW VOLTAGE, PLATING AND GALVANIZING (Also See Electrical Apparatus and Equipment.)**

Bennett-O'Connell Co., Chicago, Ill.
Bogue, Chas. J., Electric Co., New York.
Boissier Electric Co., New York.
Connecticut Dynamo & Motor Co., Newark, N. J.
Crown Rheostat & Supply Co., Chicago, Ill.
Eager Electric Co., Watertown, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Jantz & Leist Electric Co., Cincinnati, O.
L'Hommedieu, Chas. F., & Sons Co., Chicago.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
Stevens, Frederic B., Detroit, Mich.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.
Warren Products Co., New York.

**ELECTRICAL APPARATUS AND EQUIPMENT (Also See Ammeters, Rheostats, Switchboards, Transformers, Voltmeters.**

Bogue, Chas. J., Electric Co., New York.
Boissier Electric Co., New York.
Eager Electric Co., Watertown, N. Y.
General Electric Co., Schenectady, N. Y.
Munning, A. P., & Co., New York-Chicago.
Weston Electrical Instrument Co., Newark, N. J.

**ELECTRIC CRANES (See Cranes.)**

**ELECTRICAL CONDUCTORS, ALUMINUM**

Aluminum Company of America, Pittsburgh, Pa.

**ELECTRIC FURNACES**

**Annealing, Hardening, Etc.**

Booth Electric Furnace Co., Chicago, Ill.
Detroit Electric Furnace Co., Detroit, Mich.
Electric Furnace Co., Alliance, Ohio.
General Electric Co., Schenectady, N. Y.

**Laboratory**

Booth Electric Furnace Co., Chicago, Ill.
Detroit Electric Furnace Co., Detroit, Mich.
Electric Furnace Co., Alliance, Ohio.
General Electric Co., Schenectady, N. Y.

**Melting**

Ajax Metal Co., Philadelphia, Pa.
Booth Electric Furnace Co., Chicago, Ill.
Detroit Electric Furnace Co., Detroit, Mich.
Electric Furnace Co., Alliance, Ohio.
General Electric Co., Schenectady, N. Y.
Pittsburgh Electric Furnace Co., Pittsburgh, Pa.

**ELECTRIC HOISTS (See Hoists.)**

**ELECTRIC LOCOMOTIVES, INDUSTRIAL**

General Electric Co., Schenectady, N. Y.

**ELECTRIC OVENS (See Ovens; Also Core Ovens.)**

**ELECTRO-GALVANIZING, JOB AND CONTRACT**

Galvanizing Corp. of America, Brooklyn, N. Y.
Hassall, John, Inc., Brooklyn, N. Y.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
**U. S. Electro Galvanizing Co., Brooklyn, N. Y.**

**ELECTRO GALVANIZING EQUIPMENT AND SUPPLIES (See Dynamos; Plating Barrels; Plating Machines, Automatic; Tanks; Etc.)**

**ELECTRO GALVANIZING MACHINES, AUTOMATIC (See Plating Machines, Automatic.)**

**ELECTRO GALVANIZING SOLUTION**

**Galvanizing Corporation of America, Brooklyn, N. Y.**
**Meaker Galvanizing Co., Chicago, Ill.**

**ELECTRO PLATING, JOB & CONTRACT (Also See Aluminum, Electro Plating of: Polishing and Burnishing; Plating, Barrel Method.)**

**Hassall, John, Inc., Brooklyn, N. Y.**
**Sievering, Philip, New York.**

**ELECTRO PLATING EQUIPMENT AND SUPPLIES (See Kind Wanted.)**

**EMERY**

Hanson & Van Winkle Co., Newark, N. J.
**Munning, A. P., & Co., New York-Chicago.**
Niagara Emery Mills, New York.
Stevens, Frederic B., Detroit, Mich.
Warren Products Co., New York.

**EMERY WHEEL DRESSING MACHINES**

Webster & Perks Tool Co., Springfield, Ohio.

**ENAMELING**

Enameling & Stamping Corp., Long Island City, New York.

**ENAMELING OVENS (See Ovens.)**

**ENAMELS**

**Colored**

Celluloid Zapo Co., New York.
Dupont Chemical Works, New York.
Hilo Varnish Corporation, Brooklyn, N. Y.
Maas & Waldstein Co., New York.
Nikolas, G. J., & Co., Chicago, Ill.

**Lacquer**

Apothecaries Hall Co., Waterbury, Conn.
Celluloid Zapon Co., New York.
Dupont Chemical Works, New York.
Egyptian Lacquer Mfg. Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Hilo Varnish Corporation, Brooklyn, N. Y.
Maas & Waldstein Co., New York.
Nikolas, G. J., Co., Chicago, Ill.
United States Lacquer Co., Inc., Brooklyn, N. Y.

**Wood**

Celluloid Zapon Co., New York.
Dupont Chemical Works, New York.
Egyptian Lacquer Mfg. Co., New York.
Hilo Varnish Corporation, Brooklyn, N. Y.
Maas & Waldstein Co., New York.
United States Lacquer Co., Inc., Brooklyn, N. Y.

**ENAMEL SPRAYERS (See Sprayers.)**

**ENGINEERS**

**Foundry**

American Foundry Equipment Co., Chicago, Ill.

**Furnace**

Booth Electric Furnace Co., Chicago, Ill.
**Kenworthy, Chas. F., Waterbury, Conn.**
**Monarch Engineering & Mfg. Co., Baltimore, Md.**
Rockwell, W. S., Co., New York.

**Industrial**

Knoeppel, C. E., & Co., Inc., New York.

**Industrial Cleaning**

Oakley Chemical Co., New York.

**Metal Finishing**

Divine Bros. Co., Utica, N. Y.

**Polishing and Grinding**

Divine Bros. Co., Utica, N. Y.
Norton Co., Worcester, Mass.
Webster & Parks Tool Co., Springfield, Ohio.

**ESCUTCHEON PINS, ALL METALS**

Hassall John, Inc., Brooklyn, N. Y.

**EXHAUST FANS AND HEADS (Also See Blowers and Blow Piping; Dust Collectors and Ventilating Systems.)**

Allington & Curtis Mfg. Co., Saginaw, Mich.
Cleveland Blow Pipe & Mfg. Co., Cleveland, O.

**ETHYL ACETATE**

Dupont Chemical Works, New York.
Nikolas, G. J., Co., Chicago, Ill.

**EXTRUDED MOLDINGS AND SHAPERS (See Moldings, Etc.)**

**FACINGS (See Foundry Facings.)**

**FELT POLISHING WHEELS (Also See Buffing and Polishing Wheels.)**

Bacon Felt Co., Winchester, Mass.
Divine Bros. Co., Utica, N. Y.
Eastern Felt Co., Winchester, Mass.
Hanson & Van Winkle Co., Newark, N. J.
Munning, A. P., & Co., New York-Chicago.

**FELT SHEETS**

Bacon Felt Co., Winchester, Mass.
Eastern Felt Co., Winchester, Mass.

**FIG CLEANSER (Also See Cleaning Compounds, Whale Oil Soap.)**

International Chemical Co., Camden, N. J.

**FILTERS, AIR**

DeVilbiss Mfg. Co., Toledo, Ohio.
Nikolas, G. J., Co., Chicago, Ill.

**FIRE CEMENT**

American Alloys Co., Baltimore, Md.
Buckeye Products Co., Cincinnati, Ohio.
Clinton Metallic Paint Co., Clinton, N. Y.
Crescent Refractories Co., Curwensville, Pa.
Hausfeld Co., Harrison, Ohio.
Obermayer, S., Co., Pittsburgh, Pa.
Pecora Paint Co., Philadelphia, Pa.
Quigley Furnace Specialties Co., New York.

**FIRE DOORS AND SHUTTERS**

Merchant & Evans Co., Philadelphia, Pa.

**FIRE EXTINGUISHERS**

American-La France Fire Engine Co., Inc., Elmira, N. Y.

**FIRE EQUIPMENT**

American-La France Fire Engine Co., Inc., Elmira, N. Y.

**FIRST AID EQUIPMENT & SUPPLIES**

American-La France Fire Engine Co., Inc., Elmira, N. Y.

**FLASKS, BRASS MOLDERS**

Bennett & Seeley, Bridgeport, Conn.
Buckeye Products Co., Cincinnati, Ohio.
Obermayer, S., Co., Pittsburgh, Pa.

**FLINT SHOP**

U. S. Silica Co., Chicago, Ill.

**FLOORNG COMPOSITION**

Armstrong Cork & Insulation Co., Pittsburgh, Pa.

**FLUXES**

**Galvanizing**

Celluloid Zapon Co., New York.
United American Metals Corporation, Brooklyn, N. Y.

**Metal Melting**

American Boron Products Co., Reading, Pa.
Buckeye Products Co., Cincinnati, Ohio.
Obermayer, S., Co., Pittsburgh, Pa.
Shawinigan Electro-Metals Co., Ltd., Cleveland, Ohio.

**Soldering Gold and Silver**

Ney, J. M., Co., Hartford, Conn.

**Soldering and Tinning**

Aluminum Co. of America, Pittsburgh, Pa.
Celluloid Zapon Co., New York.
Hess & Son, Philadelphia, Pa.

**FOIL (See Leaf and Foil.)**

**FORGINGS (Also See Automobile Forgings.)**

**Aluminum**

Aluminum Co. of America, Pittsburgh, Pa.
Mueller Metals Co., Port Huron, Mich.

**Brass and Bronze**

Mueller Metals Co., Port Huron, Mich.
Scovill Mfg. Co., Waterbury, Conn.

**Nickel-Silver**

Mueller Metals Co., Port Huron, Mich.

**FOUNDRY EQUIPMENT AND SUPPLIES (See Kind Wanted.)**

**FOUNDRY ENGINEERS (See Engineers.)**

**FOUNDRY FACINGS**

Buckeye Products Co., Cincinnati, Ohio.
Obermayer, S., Co., Pittsburgh, Pa.
Paxson, J. W., Co., Philadelphia, Pa.
Stevens, Frederic B., Detroit, Mich.
Woodison, E. J., Co., Detroit, Mich.

**FOUNDRY RIDDLES (Also See Sand Sifters.)**

American Foundry Equipment Co., Chicago, Ill.

**FOUNDRY SPRAYERS (See Sprayers.)**

**FRICTIONS**

Divine Bros. Co., Utica, N. Y.

**FURNACE CEMENT (See Fire Cement.)**

**FURNACE ENGINEERS (See Engineers.)**

**FURNACE INSULATION (See Brick, Insulating; Insulating Cement; Insulation, Furnace.)**

**FURNACES (See Annealing Furnaces; Burners; Electric Furnaces; Galvanizing & Tinning Furnaces; Heat Treating Furnaces; Melting Furnaces; Powdered Coal Burning Furnaces; Smelting Furnaces.)**

**FURNACE TILE AND LININGS (Also See Fire Brick.)**

Buckeye Products Co., Cincinnati, Ohio.
Crescent Refractories Co., Curwensville, Pa.
Monarch Engineering & Mfg. Co., Baltimore, Md.

**FUSEL OIL**

Franco-American Chemical Co., Carlstadt, N. J.
Nikolas, G. J., & Co., Chicago, Ill.

**GALVANIZING (See also Electro Galvanizing, Job, and Contract; Hot Galvanizing, Job and Contract.)**

New Jersey Zinc Co., New York.

**GALVANIZING AND TINNING FURNACES (Also See Burners.)**

Improved Appliance Co., Brooklyn, N. Y.
Monarch Engineering & Mfg. Co., Baltimore, Md.

**GALVANIZING EQUIPMENT AND SUPPLIES (See Kind Wanted. Also Plating and Galvanizing Barrels; Plating and Galvanizing Machines, Automatic; Hot Galvanizing and Tinning Equipment.)**

**GAS BURNERS (See Burners.)**

**GAS MASKS**

American-La France Fire Engine Co., Inc., Elmira, N. Y.
Hygeia Respirator Co., Inc., New York.

**GATE CUTTERS (See Saws; Sprue Cutters.)**

**GENERATORS (See Dynamos; Motor-Generator Sets.)**

**GLOVES**

**Men's Work**

Hickory Steel Grip Glove Co., Chicago, Ill.

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

**Sand Blast**
Hickory Steel Grip Glove Co., Chicago, Ill.
**Steel Grip**
Hickory Steel Grip Glove Co., Chicago, Ill.

**GLUE FOR POLISHING**
Divine Bros. Co., Utica, N. Y.

**GLUE HEATERS AND POTS**
Divine Bros. Co., Utica, N. Y.

**GOGGLES**
American-La France Fire Engine Co., Inc., Elmira, N. Y.

**GOLD (See Anodes; Bars; Metal Dealers; Smelters and Refiners.)**

**GOLD, BORONIC**
American Boron Products Co., Reading, Pa.

**GRAPHITE PRODUCTS, PHOSPHORIZERS, STIRRERS, ETC. (Also See Crucibles.)**
Bartley, Jonathan, Crucible Co., Trenton, N. J.
Dixon, Joseph, Crucible Co., Jersey City, N. J.
Gautier, J. H., & Co., Jersey City, N. J.
McCullough-Dalzell Crucible Co., Pittsburgh, Pa.
Seidel, R. B., Inc., Philadelphia, Pa.
Taylor, Robt., J., Inc., Philadelphia, Pa.
Vesuvius Crucible Co., Swissvale, Pa.

**GRINDING, FLEXIBLE**
Divine Bros. Co., Utica, N. Y.

**GRINDING MACHINES**
Connecticut Dynamo & Motor Co., Newark, N. J.
Divine Bros. Co., Utica, N. Y.
Gardner Machine Co., Beloit, Wis.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
Norton Co., Worcester, Mass.
Stevens, Frederic B., Detroit, Mich.
Webster & Perks Tool Co., Springfield, Ohio.
**Disc**
Gardner Machine Co., Beloit, Wis.

**GRINDING WHEEL HOODS (See Dust Collectors and Ventilating Systems; Hoods.)**

**HARDNESS TESTING APPARATUS (Also See Scleroscopes.)**
Shore Instrument Co., New York.

**HEAT-TREATING FURNACES**
**Electric**
Booth Electric Furnace Co., Chicago, Ill.
Detroit Electric Furnace Co., Detroit, Mich.
Electric Furnace Co., Alliance, Ohio.

**HOISTS (Also See Cranes.)**
**Air, Chain, Electric, Pneumatic, Hydraulic**
General Electric Co., Schenectady, N. Y.
Northern Engineering Works, Detroit, Mich.

**HOODS (Also See Dust Collectors and Ventilating Systems.)**
**Polishing and Grinding Wheel**
Cleveland Blow Pipe Mfg. Co., Cleveland, Ohio.
Gardner Machine Co., Beloit, Wis.
Kirk & Blum Co., Cincinnati, Ohio.
Webster & Perks Tool Co., Springfield, Ohio.
**Spraying**
Cleveland Blow Pipe & Mfg. Co., Cleveland, Ohio.
De Vilbiss Mfg. Co., Toledo, Ohio.
Eclipse Air Brush Co., Newark, N. J.

**HOT GALVANIZING AND TINNING; JOB AND CONTRACT**
Malleable Iron Fittings Co., Branford, Conn.
New Standard Hardware Works, Mount Joy, Pa.
Watrous, E. L., Galvanizing Co., Chicago, Ill.

**HOT TINNING SUPPLIES (See Hot Galvanizing and Tinning Equipment.)**

**HOT GALVANIZING AND TINNING EQUIPMENT (Also See Burners; Galvanizing and Tinning Furnaces; Kettles; Tanks.)**
New Standard Hardware Works, Mount Joy, Pa.
Watrous, E. L., Galvanizing Co., Chicago, Ill.

**HOT GALVANIZING MACHINE**
Watrous, E. L., Galvanizing Co., Chicago, Ill.

**HOT TINNING (See Hot Galvanizing and Tinning.)**

**HYDRAULIC MACHINERY, PRESSES, JACKS, Etc. (Also See Accumulators; Presses.)**
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Watson-Stillman Co., New York.

**INDUSTRIAL ENGINEERS**
Knoeppel, C. E., & Co., Inc., New York.

**INGOT MOLDS (See Molds.)**

**INGOTS (Also See Smelters and Refiners.)**
**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
British Aluminum Co., Toronto, Ontario.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Great Western Smelting & Refining Co., St. Louis, Mo.
Leygrand & Co., New York.
Loewenthal Co., Chicago, Ill.
U. S. Reduction Co., Chicago, Ill.
**Aluminum Bronze**
Electric Smelting & Aluminum Co., Lockport, N. Y.
**Brass, Bronze and Composition**
Ajax Metal Co., Philadelphia, Pa.
Birkenstein, S., & Sons, Chicago, Ill.
Henning, V., & Sons, Brooklyn, N. Y.
Loewenthal Co., Chicago, Ill.
Richards & Co., Boston, Mass.
Whipple & Choate, Bridgeport, Conn.
White & Bro., Philadelphia, Pa.
**Calcium-Copper**
American Magnesium Corporation, Niagara Falls, N. Y.
**Copper**
Balbach Smelting & Refining Co., Newark, N. J.
Baltimore Copper Smelting & Rolling Co., Baltimore, Md.
Hendricks Bros., New York.
Richards & Co., Boston, Mass.
Superior Metal Co., New York.
Trotter, Nathan, & Co., Philadelphia, Pa.
United American Metals Corporation, Brooklyn, N. Y.
U. S. Smelting, Refining and Mining Co., New York.
White & Bro., Inc., Philadelphia, Pa.
**Lead**
United Metals Selling Co., New York.
**Manganese-Bronze**
American Manganese Bronze Co., Holmesburg, Philadelphia, Pa.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Richards & Co., Boston, Mass.
**Manganese-Copper**
Electric Smelting & Aluminum Co., Lockport, N. Y.
Lang, R. F., New York.
Metal & Thermit Corporation, New York.
**Phosphor-Bronze**
Birkenstein, S., & Sons, Chicago, Ill.
Damascus Bronze Co., Pittsburgh, Pa.
**Phosphor-Copper**
Electric Smelting & Aluminum Co., Lockport, N. Y.
Lang, R. F., New York.
Richards & Co., Boston, Mass.
United American Metals Corporation, Brooklyn, N. Y.
**Phosphor-Tin**
Damascus Bronze Co., Pittsburgh, Pa.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Lang, R. F., New York.
Richards & Co., Boston, Mass.
United American Metals Corporation, Brooklyn, N. Y.
**Silicon-Copper**
Electric Smelting & Aluminum Co., Lockport, N. Y.
Lang, R. F., New York.
**Silvel Metal**
Silvel Metal Mfg. Co., New York.
**Silver**
Handy & Harman, New York.
**Slab Zinc**
Richards & Co., Boston, Mass.
**Tin**
Ajax Metal Co., Philadelphia, Pa.
Baltimore Copper Smelting & Rolling Co., Baltimore, Md.
Richards & Co., Boston, Mass.
United American Metals Corporation, Brooklyn, N. Y.
U. S. Reduction Co., Chicago, Ill.
Weil, Louis, New York.
Wenger, Paul, New York.
**White Metals**
Columbia Smelting & Refining Works, New York.
Michigan Smelting & Refining Co., Detroit, Mich.

**INSTRUMENTS (Electrical Measuring.)**
Weston Electrical Instrument Co., Newark, N. J.

**INSULATING BRICK (See Brick.)**

**INSULATING CEMENT, HEAT**
Armstrong Cork and Insulation Co., Pittsburgh, Pa.
Quigley Furnace Specialties Co., New York.

**INSULATION (Also See Brick, Insulating; Insulating Cement.)**
**Boiler**
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
**Oven**
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
**Furnace**
Armstrong Cork & Insulation Co., Pittsburgh, Pa.
**Pipe**
Armstrong Cork & Insulation Co., Pittsburgh, Pa.

**IRON CASTINGS (See Castings.)**

**JAPANNING**
Enameling & Stamping Corp., Long Island City, New York.

**JAPANNING BARRELS (See Tumbling Barrels.)**

**JAPANNING OVENS (See Ovens.)**

**JAPANS, ALL KINDS**
Hilo Varnish Corporation, Brooklyn, N. Y.

**JEWELERS' BRUSHES (See Brushes.)**

**JEWELERS' EQUIPMENT AND SUPPLIES (Also See Kind Wanted.)**
Leiman Bros., New York.
Smith-Richardson Co., Attleboro, Mass.

**JEWELERS' ROLLS (See Rolls.)**

**JEWELERS' SOLDERS (See Solders.)**

**JIGS, FIXTURES, Etc. (See Tools, Jigs Fixtures.)**

**KENETROUS (High Voltage Rectifiers)**
General Electric Co., Schenectady, N. Y.

**KETTLES**
**Hot Galvanizing and Tinning**
New Standard Hardware Works, Mount Joy, Pa.

**LABORATORIES (See Testing Laboratories.)**

**LACQUERING BARRELS (See Tumbling Barrels.)**

**LACQUER ENAMELS (See Enamels.)**

**LACQUERING OVENS (See Ovens.)**

**LACQUERS**
**Colored**
Celluloid Zapon Co., New York.
Dupont Chemical Works, New York.
Egyptian Lacquer Mfg. Co., New York.
Hilo Varnish Corporation, Brooklyn, N. Y.
Maas & Waldstein Co., New York.
Nikolas, G. J., Co., Chicago, Ill.
**Metal**
Apothecaries Hall Co., Waterbury, Conn.
Celluloid Zapon Co., New York.
Dupont Chemical Works, New York.
Egyptian Lacquer Mfg. Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Kalbfleisch Corporation, New York.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Maas & Waldstein Co., New York.
Nikolas, G. J., Co., Chicago, Ill.
United States Lacquer Co., Inc., Brooklyn, N. Y.
**Wood**
Celluloid Zapon Co., New York.
Dupont Chemical Works, New York.
Maas & Waldstein Co., New York.
United States Lacquer Co., Inc., Brooklyn, N. Y.

**LACQUER SPRAYERS (See Sprayers.)**

**LADLE HEATERS AND DRYERS**
Hawley Down-Draft Furnace Co., Easton, Pa.
Monarch Engineering & Mfg. Co., Baltimore, Md.

**LAMPS, ARC AND INCANDESCENT**
General Electric Co., Schenectady, N. Y.

**LATHES (See Also Polishing Lathes.)**
**Brass-Working**
Webster & Perks Tool Co., Springfield, O.
**Spinning**
Bliss, E. W., Co., Brooklyn, N. Y.
Pryibil, P., Machine Co., New York.

**LEAD, PIG AND BAR**
American Zinc, Lead & Smelting Co., New York.
Baltimore Copper Smelting & Rolling Co., Baltimore, Md.
Chadwick-Boston Co., Boston, Mass.
Union Smelting & Refining Co., Inc., Newark, N. J.
United States Smelting, Refining & Mining Co., New York.

**LEAD PIPE AND TUBING**
Union Smelting & Refining Co., Inc., Newark, N. J.

**LEAD WIRE AND RIBBON**
Union Smelting & Refining Co., Inc., Newark, N. J.

**LEAD-LINED TANKS (See Tanks.)**

**LEAF AND FOIL, ALUMINUM**
Aluminum Company of America, Pittsburgh, Pa.

**LEATHER POLISHING WHEELS (See Buffing and Polishing Wheels.)**

**LEGGINGS, PROTECTIVE**
Hickory Steel Grip Glove Co., Chicago, Ill.

**LOCOMOTIVES, INDUSTRIAL (See Electric Locomotives.)**

**LUBRICANTS, Cutting and Grinding, Drawing, Stamping.**
Oakley Chemical Co., New York.

**MACHINED PRODUCTS**
**Aluminum**
Mueller Metals Co., Port Huron, Mich.
**Iron and Steel**
Mueller Metals Co., Port Huron, Mich.

**MACHINERY (See Kind Wanted.)**

**MAGNESIUM METAL**
**Sheet, Wire, Rod, Ribbon, Powder**
American Magnesium Corporation, Niagara Falls, N. Y.
Leavitt, C. W., & Co., New York.
Norton Laboratories, New York.
Shawinigan Electro Metals Co., Ltd., Cleveland, O.

**MAGNETIC SEPARATORS (See Also Reclaiming Machinery.)**
Dings Magnetic Separator Co., Milwaukee, Wis.
Magnetic Mfg. Co., Milwaukee, Wis.
Paxson, J. W., Co., Philadelphia, Pa.

**MANGANESE, 98-99%**
Metal & Thermit Corporation, New York.

**MANGANESE-BRONZE (See Ingots.)**

**MANGANESE-COPPER (See Ingots.)**

**MANTLE DIP**
Nikolas, G. J., Co., Chicago, Ill.

**MELTING FURNACES (Also See Burners.)**
**Aluminum**
Booth Electric Furnace Co., Chicago, Ill.
**Brass**
Booth Electric Furnace Co., Chicago, Ill.
**Electric**
Booth Electric Furnace Co., Chicago, Ill.
Detroit Electric Furnace Co., Detroit, Mich.
Electric Furnace Co., Alliance, Ohio.
General Electric Co., Schenectady, N. Y.
Pittsburgh Electric Furnace Co., Pittsburgh, Pa.
**Electric Rotary**
Booth Electric Furnace Co., Chicago, Ill.
**Coal or Coke**
Buckeye Products Co., Cincinnati, Ohio.
Ideal Furnace Co., Chester, Pa.
Monarch Engineering & Mfg. Co., Baltimore, Md.

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

Obermayer, S., Co., Pittsburgh, Pa.
Woodison, E. J., Co., Detroit, Mich.

**Non-Crucible**
Booth Electric Furnace Co., Chicago, Ill.

**Oil or Gas**
Buckeye Products Co., Cincinnati, Ohio.
Hausfeld Co., Harrison, Ohio.
Hawley Down-Draft Furnace Co., Easton, Pa.
Ideal Furnace Co., Chester, Pa.
Kenworthy, Chas. F., Waterbury, Conn.
Maxon-Premix Burner Co., Muncie, Ind.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Obermayer, S., Co., Pittsburgh, Pa.
U. S. Smelting Furnace Co., Belleville, Ill.

**Pit**
Buckeye Products Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Paxson, J. W., Co., Philadelphia, Pa.
Stevens, Frederic B., Detroit, Mich.

**Reverberatory**
Hawley Down-Draft Furnace Co., Easton, Pa.
Monarch Engineering & Mfg. Co., Baltimore, Md.
Rockwell, W. S., Co., New York.

**Rotary and Tilting**
Booth Electric Furnace Co., Chicago, Ill.
U. S. Smelting Furnace Co., Belleville, Ill.

**Soft Metal**
Improved Appliance Co., Brooklyn, N. Y.

**METAL BRIQUETTES (See Briquet-Ingots.)**

**METAL DEALERS (Also See Drosses, Residues, Etc., Buyers of; Turnings, Chips, Etc., Buyers of.)**

**Gold, Silver, Platinum**
Ney, J. M., & Co., Hartford, Conn.
Radnai, Josef, New York.
Roessler & Hasslacher Chemical Co., New York.

**New Metals**
Queens Brass & Copper Co., New York.
Nassau Smelting & Refining Co., New York.
North Atlantic Metal Corporation, New York.
Trotter, Nathan, & Co., Philadelphia, Pa.
Weil, Louis, New York.
Wenger, Paul, New York.

**Old Metals**
Henning, V., & Sons, Brooklyn, N. Y.
Herscopf, Ch., & Son, Brooklyn, N. Y.
Lehman Bros., Inc., Hoboken, N. J.
Metal Purchasing Co., New York.
Queens' Brass & Copper Co., New York.
Superior Metal Co., New York.

**Rare Metals**
North Atlantic Metal Corporation, New York.
Radnai, Josef, New York.

**Zinc**
New Jersey Zinc Co., New York.

**METAL CLEANERS (See also Cleaning Compounds.)**
Oakley Chemical Co., New York.

**METAL ETCHING BY ELECTRICITY, COMPLETE PLANTS FOR**
Boissier Electric Co., New York.

**METAL GOODS MADE TO ORDER (Also See Stamping and Drawing.)**
Bossert Corporation, Utica, N. Y.
Chase Metal Works, Waterbury, Conn.
Kenworthy, Charles F., Inc., Waterbury, Conn.
Scovill Mfg. Co., Waterbury, Conn.
Warner Bros. Co., Bridgeport, Conn.

**METALS (See Kind Wanted, Also Metal Dealers.)**

**METAL PARTS WASHING MACHINE**
Crescent Washing Machine Co.

**METAL RECLAIMING EQUIPMENT (See Concentrating Tables; Crushers and Pulverizers; Magnetic Separators.)**

**METAL ROOFING**
Merchant & Evans Co., Philadelphia, Pa.

**METALS, PLATED SHEET (See Plated and Polished Sheet Metals; Sheets.)**

**METALS, RARE (See Metal Dealers.)**

**METERS (Electrical Measuring.)**
Weston Electrical Instrument Co., Newark, N. J.

**MILLS, CRUSHING (Also see Crushers and Pulverizers.)**
Hardinge Conical Mill Co., New York.

**MITTENS, STEEL-GRIP LEATHER**
Hickory Steel Grip Glove Co., Chicago, Ill.

**MOLD DRYERS, PORTABLE**
Monarch Engineering & Mfg. Co., Baltimore, Md.

**MOLDING MACHINES**

**Hand-Operated**
B. & B. Manufacturing Co., Indianapolis, Ind.
Turner Machine Co., Philadelphia, Pa.

**Power**
B. & B. Manufacturing Co., Indianapolis, Ind.
Cleveland-Osborn Mfg. Co., Cleveland, Ohio.
Turner Machine Co., Philadelphia, Pa.

**MOULD MAKERS, MOLDING, ETC.**
Stenson, Andrew, New York.

**MOLDING SAND (See Sand.)**

**MOLDINGS AND EXTRUDED SHAPES, ALUMINUM**
Aluminum Company of America, Pittsburgh, Pa.

**MOLDS**

**Babbitt and Solder**
Fanning, J. P., Brooklyn, N. Y.
Schweizer, Chas. K., St. Louis, Mo.

**Ingot**
Fanning, J. P., Brooklyn, N. Y.
Schweizer, Chas. K., St. Louis, Mo.

**MOLD SPRAYERS (See Sprayers.)**

**MOTOR CONTROL EQUIPMENT (Also see Electrical Apparatus and Equipment.)**
General Electrical Co., Schenectady, N. Y.

**MOTORS, ELECTRIC (Also See Electrical Apparatus and Equipment.)**
Boissier Electric Co., New York.
Eager Electric Co., Watertown, N. Y.
General Electric Co., Schenectady, N. Y.
Munning, A. P., & Co., New York-Chicago.

**MOTOR-GENERATOR SETS (Also See Dynamos; Electrical Apparatus and Equipment.)**
Boissier Electric Co., New York.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Crown Rheostat & Supply Co., Chicago, Ill.
Eager Electric Co., Watertown, N. Y.
General Electric Co., Schenectady, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Jantz & Leist Electric Co., Cincinnati, Ohio.
Munning, A. P., & Co., New York-Chicago.

**MUNTZ'S METAL (See Sheets.)**

**NICHROME HEAT RESISTING ALLOYS (See Castings; Dipping Baskets, Wire.)**

**NICKEL (See Anodes; Castings; Ingots; Sheets; Wire; Etc.**

**NICKEL, Boronic**
American Boron Products Co., Reading, Pa.

**NICKEL SALTS**
Apothecaries Hall Co., Waterbury, Conn.
Asphaltum & Chemical Products Co., New York.
Cooper, Chas., & Co., New York.
General Platers Supply Co., New York.
Hanson & Van Winkle Co., Newark, N. J.
Harshaw, Fuller & Goodwin Co., Cleveland, Ohio.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
New York Buff Co., New York.
Roessler & Hasslacher Chemical Co., New York.
Stevens, Frederic B., Detroit, Mich.
Wiarda, John C., & Co., Brooklyn, N. Y.
Woodison, E. J., Co., Detroit, Mich.

**NICKEL SILVER (See also Brass, Sheets, Wire, Rod, Tube; Castings; Forgings; Sheets; Etc.)**

**Sheet, Wire, Rod, Tube**
American Brass Co., Waterbury, Conn.

**OHMMETERS**
Weston Electrical Instrument Co., Newark, N. J.

**OIL BURNERS (See Burners.)**

**OIL PUMPS (See Oil Storage Systems.)**

**OIL STORAGE SYSTEMS**
Buckeye Products Co., Cincinnati, Ohio.
Monarch Engineering & Mfg. Co., Baltimore, Md.

**OLD METALS (See Drosses, Residues, Etc., Buyers of; Metal Dealers.)**

**ORNAMENTAL METAL WORK**
Stenson, Andrew, New York.

**OVENS (Also See Burners; Also Core Ovens.)**

**Electric**
General Electric Co., Schenectady, N. Y.

**Enameling, Lacquering, Japanning**
Gehnrich Indirect Heat Oven Co., Brooklyn, N. Y.
Improved Appliance Co., Brooklyn, N. Y.
Steiner, E., & Co., Newark, N. J.

**OVEN BURNERS (See Burners.)**

**OVEN INSULATION (See Brick, Insulating; Insulating Cement; Insulation.)**

**PAINT SPRAYERS (See Sprayers.)**

**PARTING COMPOUNDS**
Buckeye Products Co., Cincinnati, Ohio.

**PATENT ATTORNEY**
Boyle, John, Jr., Washington, D. C.

**PATTERN SHOP EQUIPMENT (See Lathes; Saws.)**

**PAVING BRICK, CORK (See Brick.)**

**PHOSPHOR BRONZE (See Ingots.)**

**PHOSPHORIZERS (See Graphite Products.)**

**PHOSPHOR COPPER (See Ingots.)**

**PHOSPHOR-COPPER, BORONIC**
American Boron Products Co., Reading, Pa.

**PHOSHOR-TIN (See Ingots.)**

**PHOSPHOR-TIN, BORONIC**
American Boron Products Co., Reading, Pa.

**PHOSPHORUS**
General Chemical Co., Philadelphia, Pa.

**PICKLING COMPOUNDS (Also See Cleaning Compounds.)**
Hanson & Van Winkle Co., Newark, N. J.

**PICKLING MACHINES, AUTOMATIC**
No-Dust Drying Machine Co., Providence, R. I.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

**PIPE, ALUMINUM**
Aluminum Company of America, Pittsburgh, Pa.

**PIPE AND BOILER COVERINGS, STEAM, ICE WATER, BRINE (See Also Insulation.)**

**PLATED AND POLISHED SHEET METALS (See Also Sheets.)**
American Nickeloid Co., Peru, Ill.
Apollo Metal Works, La Salle, Ill.
National Sheet Metal Co., Peru, Ill.

**PLATERS' BRUSHES (See Brushes.)**

**PLATERS' COMPOUND (See Whale Oil Soap.)**

**PLATING AND GALVANIZING MACHINES, AUTOMATIC (See also Plating Barrel.)**
Galvanizing Corporation of America, Brooklyn, N. Y.
Hanson & Van Winkle Co., Newark, N. J.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
National Galvanizing & Plating Equipment Corp., New York.
U. S. Electric Galvanizing Co., Brooklyn, N. Y.

**PLATING AND GALVANIZING BARRELS**
Boissier Electric Co., New York.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Crown Rheostat & Supply Co., Chicago, Ill.
Hanson & Van Winkle Co., Newark, N. J.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

**PLATING, BARREL METHOD, JOB AND CONTRACT (Also See Electroplating.)**
Sievering, Philip, New York.

**PLATING EQUIPMENT AND SUPPLIES (See Kind Wanted.)**

**PLATINUM (See Smelters and Refiners; Anodes; Bars; Metal Dealers; Sheets, Etc.)**

**PLATINUM BUFFING CAKE (See Also Buffing and Polishing Compositions.)**
Matchless Metal Polish Co., Glen Ridge, N. J.
Munning, A. P., & Co., New York-Chicago.

**PLATINUM SCRAP (See Metal Dealers.)**

**PLUMBAGO (See Graphite Products.)**

**POLISHING BARRELS (See Burnishing Barrels.)**

**POLISHING, BELTS, ENDLESS**
Ames Sword Co., Chicopee, Mass.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.

**POLISHING COMPOSITIONS (See Buffing and Polishing Compositions.)**

**POLISHING EQUIPMENT AND SUPPLIES (See Kind Wanted.)**

**POLISHING HOODS (See Dust Collectors and Ventilating Systems; Hoods.)**

**POLISHING LATHES AND HEADS**
Bennett O'Connell Co., Chicago, Ill.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Eager Electric Co., Watertown, N. Y.
Gardner Machine Co., Beloit, Wis.
Hanson & Van Winkle Co., Newark, N. J.
L'Hommedieu, Chas. F., & Sons Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
Webster & Perks Tool Co., Springfield, Ohio.

**POLISHING MACHINES (Also See Polishing Lathes and Heads.)**

**Disc**
Gardner Machine Co., Beloit, Wis.

**POLISHING AND BURNISHING; JOB AND CONTRACT (See Also Electro Plating.)**
Sievering, Philip, New York.

**POLISHING WHEEL DRESSING MACHINE**
Divine Bros. Co., Utica, N. Y.

**POLISHING WHEELS (See Buffing and Polishing Wheels.)**

**POLISHING & GRINDING ENGINEERS (See Engineers.)**

**POLYSULPHIDE**
Roessler & Hasslacher Chemical Co., New York.

**POTASH**
International Chemical Co., Camden, N. J.

**POWDER**

**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
Kemp, W. H., Co., New York.

**Bronze**
Dupont Chemical Works, New York.

**POWDERED COAL BURNERS (See Burners.)**

**PRESSERS (Also see Scrap Baling Machine.)**

**Bench and Foot**
Baird Machine Co., Bridgeport, Conn.
Bliss, E. W., & Co., Brooklyn, N. Y.
Shuster, F. B., Co., New Haven, Conn.

**Drop**
Miner & Peck Mfg. Co., New Haven, Conn.

**Hydraulic**
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Watson-Stillman Co., New York.

**Power, all Types**
Baird Machine Co., Bridgeport, Conn.
Bliss, E. W., Co., Brooklyn, N. Y.
Garrison, A., Foundry Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

**PRESSURE BLOWERS (See Blowers and Blow-Piping.)**

**PRESSURE AND TEMPERATURE REGULATORS**
Taylor Instrument Companies, Rochester, N. Y.

**PYROMETERS**
Taylor Instrument Companies, Rochester, N. Y.

**PYROSCOPES (Also See Pyrometers.)**
Shore Instrument Co., New York.

**RARE METALS (See Metal Dealers.)**

**RECLAIMING MACHINERY, METAL (Also see Concentrating Tables; Crushers and Pulverizers; Magnetic Separators.)**
Dings Magnetic Separator Co., Milwaukee, Wis.
Eastern Machinery Co., New Haven, Conn.
Harding Conical Mill Co., New York.

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

James Orr Concentrator Co., Newark, N. J.
Magnetic Mfg. Co., Milwaukee, Wis.
Paxson, J. W., Co., Philadelphia, Pa.
Sly, W. W. Mfg. Co., Cleveland, Ohio.
Standard Equipment Co., New Haven, Conn.

**RECORDING THERMOMETERS (See Thermometers.)**

**REFINERS AND SMELTERS (See Smelters and Refiners.)**

**RESPIRATORS**
American-La France Fire Engine Co., Inc., Elmira, N. Y.
Hygeia Respirator Co., Inc., New York.
Soderling, Walter, New York.

**RETORTS, GRAPHITE**
Dixon, Joseph, Crucible Co., Jersey City, N. J.
Gautier, J. H., & Co., Jersey City, N. J.
McCullough-Dalzell Crucible Co., Pittsburgh, Pa.

**RHEOSTATS (See also Electrical Apparatus and Equipment.)**
Bolsser Electric Co., New York.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Crown Rheostat & Supply Co., Chicago, Ill.
Eager Electric Co., Watertown, N. Y.
General Electric Co., Schenectady, N. Y.
Munning, A. P., & Co., New York-Chicago.

**RIDDLES (See Foundry Riddles.)**

**RIVETING MACHINES**
Shuster, F. B., Co., New Haven, Conn.

**RIVETS, NAILS & TACKS, ALL METALS**
Hassall, John, Inc., Brooklyn, N. Y.

**RODS AND BARS (Also see Brass Mill Products.)**
**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
British Aluminum Co., Ltd., Toronto, Can.
Electric Smelting & Aluminum Co., Lockport, N.Y.
Strahs Aluminum Co., New York.
**Brass, Bronze and Copper**
Aeronautical Equipment, Inc., New York.
American Brass Co., Waterbury, Conn.
Chase Metal Works, Waterbury, Conn.
Cleveland Brass & Copper Mills, Inc., Cleveland, Ohio.
Midwest Brass & Copper Co., New York.
Mueller Metals Co., Port Huron, Mich.
Scovill Mfg. Co., Waterbury, Conn.
**Copper**
Mueller Metals Co., Port Huron, Mich.

**ROLLING MILL MACHINERY (See Draw Benches; Hydraulic Machinery; Presses; Rolls; Shears; Slitters.)**

**ROLLS**
**Chilled Sand**
Garrison, A., Foundry Co., Pittsburgh, Pa.
**Jewelers'**
Garrison, A., Foundry Co., Pittsburgh, Pa.
Leiman Bros., New York.

**ROLLS AND COILS (See Sheets and Strip Metal.)**

**ROOF VENTILATORS**
Merchant & Evans Co., Philadelphia, Pa.

**ROUGE (Also see Buffing and Polishing Compositions.)**
Hanson & Van Winkle Co., Newark, N. J.
Matchless Metal Polish Co., Glen Ridge, N. J.
Munning, A. P., & Co., New York-Chicago.

**RUST PREVENTITIVES**
Oakley Chemical Co., New York.

**SAFETY DEVICES**
**Respirators**
American-La France Fire Engine Co., Inc., Elmira, N. Y.
Hygeia Respirator Co., Inc., New York.
Soderling, Walter, New York.
**Leggings, Protective**
Hickory Steel Grip Glove Co., Chicago, Ill.
**Gloves**
Hickory Steel Grip Glove Co., Chicago, Ill.

**SAL SODA**
Penn Chemical Works, Philadelphia, Pa.

**SAND**
**Core**
**Molding**
Paxson, J. W., Co., Philadelphia, Pa.
U. S. Silica Co., Chicago, Ill.
**For Sand Blasting**
Standard Equipment Co., New Haven, Conn.
U. S. Silica Co., Chicago, Ill.
**Silica**
U. S. Silica Co., Chicago, Ill.

**SAND BLASTS**
**Accessories and Supplies**
American Foundry Equipment Co., Chicago, Ill.
Hickory Steel Grip Glove Co., Chicago, Ill.
New Haven Sand Blast Co., New Haven, Conn.
Pangborn Corporation, Hagerstown, Md.
**Barrel**
American Foundry Equipment Co., Chicago, Ill.
Hoevel Mfg. Corporation, Jersey City, N. J.
New Haven Sand Blast Co., New Haven, Conn.
Pangborn Corporation, Hagerstown, Md.
Paxson, J. W., Co., Philadelphia, Pa.
**Cabinet**
Astle, H. J., & Co., Providence, R. I.
Leiman Bros., New York.
Pangborn Corporation, Hagerstown, Md.
Paxson, J. W., Co., Philadelphia, Pa.
**Car**
Pangborn Corporation, Hagerstown, Md.
**Revolving Table**
Hoevel Mfg. Corporation, Jersey City, N. J.
Pangborn Corporation, Hagerstown, Md.
Sly, W. W., Mfg. Co., Cleveland, Ohio.
**Sand Blast Systems**
American Foundry Equipment Co., Chicago, Ill.
New Haven Sand Blast Co., New Haven, Conn.
Pangborn Corporation, Hagerstown, Md.
Sly, W. W., Mfg. Co., Cleveland, Ohio.

**SAND DRYERS**
Pangborn Corporation, Hagerstown, Md.

**SAND MIXERS**
Wadsworth Core Machine & Equipment Co., Akron, Ohio.

**SAND SIFTERS**
American Foundry Equipment Co., Chicago, Ill.
Wadsworth Core Machine & Equipment Co., Akron, Ohio.

**SAWDUST DRYING-OUT BOXES (Also see Drying-out Machines.)**
Smith-Richardson Co., Attleboro, Mass.

**SAWDUSTLESS METAL DRYERS**
Tolhurst Machine Co., Troy, N. Y.

**SAWS**
**Circular Metal**
Pryibil, P., Machine Co., New York.
**Metal Band**
Pryibil, P., Machine Co., New York.

**SCLEROSCOPES**
Shore Instrument Co., New York.

**SCRAP METAL DEALERS (See Drosses, Residues, Etc., Buyers of; Turnings, Chips, Etc., Buyers of; Metal Dealers.)**

**SCREW MACHINE PRODUCTS (Also see Machined Products.)**
Economy Machine Products Co., Chicago. Ill.
Mueller Metals Co., Port Huron, Mich.

**SEPARATORS, MAGNETIC (See Magnetic Separators.)**

**SHEARS, POWER (Also see Slitters.)**
Bliss, E. W., Co., Brooklyn, N. Y.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

**SHEEPSKIN POLISHING WHEELS**
Yorkville Mfg. Co., Brooklyn, N. Y.

**SHEET METAL PIPING FOR ALL PURPOSES**
No-Dust-Drying Machine Co., Providence, R. I.

**SHEETS (Also see Brass Mill Products; Strip Metal.)**
**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
British Aluminum Co., Ltd., Toronto, Canada.
Electric Smelting & Aluminum Co., Lockport, N. Y.
Kemp, W. H., Co., New York.
Strahs Aluminum Co., New York.
**Brass, Copper and Nickel Silver**
American Brass Co., Waterbury, Conn.
Benson, H. K., & F. S., Glen Ridge, N. J.
Bristol Brass Co., Bristol, Conn.
Chase Metal Works, Waterbury, Conn.
Cleveland Brass & Copper Mills, Cleveland, Ohio.
Dallas Brass & Copper Co., Chicago, Ill.
Manhattan Brass & Copper Co., New York.
Merchant & Evans Co., Philadelphia, Pa.
Metal Purchasing Co., New York.
Scovill Manufacturing Co., Waterbury, Conn.
Winchester B. & C. Co., Winsted, Conn.
**Britannia Metal**
Standard Rolling Mills, Inc., Brooklyn, N. Y.
**Copper**
Baltimore Copper Smelting & Rolling Co., Baltimore, Md.
Hussey, C. G., & Co., Pittsburgh, Pa.
National Brass & Copper Co., Lisbon, Ohio.
**Muntz's Metal**
Taunton-New Bedford Copper Co., Taunton, Mass.
**Nickel**
Driver-Harris Co., Harrison, N. J.
**Nickel-Silver**
Deuber Watch Case Mfg. Co., Canton, Ohio.
Elgin-American Mfg. Co., Elgin, Ill.
Seymour Mfg. Co., Seymour, Conn.
Thinsheet Metals Co., Waterbury, Conn.
**Plated and Polished**
American Nickeloid Co., Peru, Ill.
Apollo Metal Works, La Salle, Ill.
National Sheet Metal Co., Peru, Ill.
**Platinum**
Roessler & Hasslacher Chemical Co., New York.
**Silvel Metal**
Silvel Metal Mfg. Co., New York.
**Silver, Sterling**
Handy & Harman, New York.
Jackson, John J., Co., Newark, N. J.
**Steel, Black and Galvanized**
Merchant & Evans Co., Philadelphia, Pa.
**Thin Gauge Brass, Etc.**
Thinsheet Metals Co., Waterbury, Conn.
**Zinc**
Illinois Zinc Co., Peru, Ill.
Matthiesen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York.
Platt Bros. Co., Waterbury, Conn.
Smith & McCrorken, Inc., New York.

**SIGNS, METAL SAFETY**
American-La France Fire Engine Co., Inc., Elmira, N. Y.

**SILICA, PULVERIZED**
U. S. Silica Co., Chicago, Ill.
**Silica Sand**
U. S. Silica Co., Chicago, Ill.

**SILICON-COPPER, BORONIC**
American Boron Products Co., Reading, Pa.

**SILVEL METAL**
Silvel Metal Mfg. Co., New York.

**SILVER (See Smelters and Refiners; Anodes; Bars; Castings; Ingots; Metal Dealers; Sheets; Solder; Etc.)**

**SILVER, BORONIC**
American Boron Products Co., Reading, Pa.

**SILVER CYANIDE**
Roessler & Hasslacher Chemical Co., New York.

**SILVERSMITHS' BRUSHES (See Brushes.)**

**SLAB ZINC**
American Zinc, Lead & Smelting Co., Boston, Mass.
American Zinc Products Co., Greencastle, Ind.
Hegeler Zinc Co., Danville, Ill.
Illinois Zinc Co., Peru, Ill.
Matthiesen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Co., New York.
U. S. Smelting, Refining & Mining Co., New York.

**SLAG CRUSHERS (See Crushers and Pulverizers.)**

**SLITTERS, SHEET METAL (Also see Shears.)**
Torrington Manufacturing Co., Waterbury, Conn.

**SMELTERS AND REFINERS (Also see Ingots.)**
**Copper-Bearing Material**
Capper, Pass & Son, Ltd., Bristol, England.
Girard Smelting & Refining Co., Philadelphia, Pa.
Great Western Smelting & Refining Co., St. Louis, Mo.
Loewenthal Co., Chicago, Ill.
North American Smelting Co., Philadelphia, Pa.
Whipple & Choate, Bridgeport, Conn.
**Gold**
Handy & Harmon, New York.
Ney, J. M., Co., Hartford, Conn.
**Platinum**
Roessler & Hasslacher Chemical Co., New York.
**Silver**
Handy & Harman, New York.
Ney, J. M., & Co., Hartford, Conn.
**White Metals**
Columbia Smelting & Refining Works, New York.
Girard Smelting & Refining Co., Philadelphia, Pa.
Great Western Smelting & Refining Co., St. Louis, Mo.
Lehman Bros., Hoboken, N. J.
Michigan Smelting & Refining Co., Detroit, Mich.
North American Smelting Co., Philadelphia, Pa.
Union Smelting & Refining Co., Inc., Newark, N. J.
**Zinc**
New Jersey Zinc Co., New York.

**SMELTING FURNACES, ELECTRIC**
Booth Electric Furnace Co., Chicago, Ill.

**SOAP AND SOAP CHIPS**
International Chemical Co., Camden, N. J.

**SODA, MODIFIED**
Solvay Process Co., Syracuse N. Y.

**SODA ASH**
Penn Chemical Works, Philadelphia, Pa.
Roessler & Hasslacher Chemical Co., New York.
Solvay Process Co., Syracuse, N. Y.

**SODIUM CYANIDE**
Roessler & Hasslacher Chemical Co., New York.

**SOLDER**
**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
Union Smelting & Refining Co., Inc., Newark, N. J.
**Brazing**
United American Metals Corporation, Brooklyn, N. Y.
**Ribbon**
Union Smelting & Refining Co., Inc., Newark, N. J.
**Silver**
Ney, J. M., & Co., Hartford, Conn.
**Tinners**
Hess & Son, Philadelphia, Pa.
Merchant & Evans Co., Philadelphia, Pa.
Michigan Smelting & Refining Co., Detroit, Mich.
New Era Mfg. Co., Kalamazoo, Mich.
Union Smelting & Refining Co., Inc., Newark, N. J.
United American Metals Corporation, Brooklyn, N. Y.
U. S. Reduction Co., Chicago, Ill.
**Wire**
Union Smelting & Refining Co., Inc., Newark, N. J.

**SOLDER MOLDS (See Molds.)**

**SOLDERING FLUX (See Fluxes.)**

**SOLDERING, ZINC**
New Jersey Zinc Co., New York.

**SOLVENTS**
Celluloid Zapon Co., New York.
Maas & Waldstein Co., New York.

**SPECIALTIES, METAL (See Wire Specialties; Wire Shapes and Forms; Metal Goods Made to Order.)**

**SPELTER (See Slab Zinc; also see Ingots.)**

**SPELTER SOLDER (See Solder, Brazing.)**

**SPINNING CHUCKS (See Chucks.)**

# BUYERS' GUIDE: ADVERTISERS' PRODUCTS

**SPINNING LATHES (See Lathes.)**

**SPRAYERS**

**Foundry**
De Vilbiss Mfg. Co., Toledo, Ohio.
Malleable Iron Fittings Co., Branford, Conn.

**Lacquer, Enamel, Japan, Paint**
DeVilbiss Mfg. Co., Toledo, Ohio.
Eclipse Air Brush Co., Newark, N. J.
Economy Machine Products Co., Chicago, Ill.
Eureka Pneumatic Spray Co., New York.
Holton Co., Los Angeles, Cal.
Nikolas, G. J., Co., Chicago, Ill.

**SPRAYING ACCESSORIES, HOODS, TABLES, ETC.**
De Vilbiss Mfg. Co., Toledo, Ohio.
Eclipse Air Brush Co., Newark, N. J.
Holton Co., Los Angeles, Cal.

**SPRAYING EQUIPMENT, PORTABLE**
De Vilbiss Mfg. Co., Toledo, Ohio.

**SPRUE CUTTERS (See also Saws.)**
Shuster, F. B., Co., New Haven, Conn.
Turner Machine Co., Philadelphia, Pa.

**STAMPING AND DRAWING, JOB AND CONTRACT (See also Metal Goods Made to Order.)**
Bossert Corporation, Utica, N. Y.
Bridgeport Brass Co., Bridgeport, Conn.
Kenworthy, Charles F., Inc., Waterbury, Conn.
Warner Bros. Co., Bridgeport, Conn.

**STEEL BALLS FOR BURNISHING BARRELS**
Abbott Ball Co., Hartford, Conn.
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Henderson Bros. Co., Waterbury, Conn.
Smith-Richardson Co., Attleboro, Mass.

**STEEL, BORONIC**
American Boron Products Co., Reading, Pa.

**STIRRERS (See Graphite Products.)**

**STONEWARE, ACID-PROOF (See Acid Pumps; Dipping Baskets.)**

**STRAIGHTENING, CUTTING AND FORMING MACHINERY (See Cutting, Straightening and Forming Machinery.)**

**STRIP METAL IN COILS AND ROLLS (Also see Brass Mill Products.)**

**Aluminum**
Aluminum Co. of America, Pittsburgh, Pa.

**Brass, Copper and Nickel Silver**
American Brass Co., Waterbury, Conn.
Cleveland Brass & Copper Mills, Inc., Cleveland, Ohio.
New Jersey Tube Co., Harrison, N. J.
Scovill Mfg. Co., Waterbury, Conn.
Thinsheet Metals Co., Waterbury, Conn.

**Copper**
National Brass & Copper Co., Lisbon, Ohio.

**Zinc**
New Jersey Zinc Co., New York.
Platt Bros. Co., Waterbury, Conn.
Smith & McCrorken, Inc., New York.

**SULPHATE OF ALUMINUM**
Roessler & Hasslacher Chemical Co., New York.

**SULPHATE OF COPPER**
Celluloid Zapon Co., New York.
Harrison & Van Winkle Co., Newark, N. J.
Wiarda, John C., & Co., Brooklyn, N. Y.

**SULPHURET OF POTASSIUM**
Buchanan, C. G., Chemical Co., Cincinnati, Ohio.

**SULPHOCYANIDE OF SODA**
Celluloid Zapon Co., New York.
Roessler & Hasslacher Chemical Co., New York.

**SWEEP SMELTERS (See Smelters and Refiners.)**

**SWITCHBOARDS (See also Electrical Apparatus and Equipment.)**
Boissier Electric Co., New York.
Crown Rheostat & Supply Co., Chicago, Ill.
Eager Electric Co., Watertown, N. Y.
General Electric Co., Schenectady, N. Y.

**SYNCHROSCOPES**
Weston Electrical Instrument Co., Newark, N.J.

**TANK SEDIMENT REMOVER**
Crown Rheostat & Supply Co., Chicago, Ill.

**TANKS**

**Hot Galvanizing & Tinning**
New Standard Hardware Works, Mount Joy, Pa.

**Lead-Lined**
Boissier Electric Co., New York.
Chadwick-Boston Co., Boston, Mass.

**Steel**
Munning, A. P., & Co., New York-Chicago.

**Wood**
Atlantic Tank & Barrel Corp., Hoboken, N. J.
Boissier Electric Co., New York.
Corcoran, A. J., & Co., Jersey City, N. J.
Hanson & Van Winkle Co., Newark, N. J.
Kalamazoo Tank & Silo Co., Kalamazoo, Mich.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
National Galvanizing & Plating Equipment Corp., New York.
Stearns, A. T., Lumber Co., Boston, Mass.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

**TESTING APPARATUS (See Calipers, Indicating; Pyrometers; Scleroscopes; Thermometers.)**

**TESTING LABORATORIES (See also Assayers and Chemists.)**

**Chemical**
Ledoux & Co., New York.
New York Testing Laboratories, New York.
Norton Laboratories, New York.
Ricketts & Co., Ltd., New York.
Thomson, S. H., Chemical Laboratories, Dayton, Ohio.

**Physical**

**THERMIT**
Metal & Thermit Corporation, New York.

**THERMOMETERS**

**Index**
Taylor Instrument Companies, Rochester, N. Y.

**Recording**
Taylor Instrument Companies, Rochester, N. Y.

**TIN; PIG, BAR AND BLOCK (See also Ingots, Tin.)**
Union Smelting & Refining Co., Inc., Newark, N. J.

**TIN PLATE**
Merchant & Evans Co., Philadelphia, Pa.

**TIN SUBSTITUTE**
New Era Mfg. Co., Kalamazoo, Mich.

**TINNING (See Electro Plating; Hot Galvanizing and Tinning.)**

**TINNING FURNACES (See Galvanizing and Tinning Furnaces.)**

**TINNING FLUXES (See Fluxes.)**

**TOOL HARDENING FURNACES (See Heat Treating Furnaces.)**

**TOOLS, JIGS; FIXTURES, ETC.**
Webster & Perks Tool Co., Springfield, Ohio.

**TRIPOLI, LUMP AND GROUND**
American Tripoli Co., Seneca, Mo.

**TRANSFORMERS**
General Electric Co., Schenectady, N. Y.

**TROLLEYS (See Overhead Trolley Systems.)**

**TRUCK WHEELS**
Divine Bros. Co., Utica, N. Y.

**TUBE MILL MACHINERY (See Kind Wanted.)**

**TUBES (Also see Brass Mill Products.)**

**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.

**Brass, Bronze and Copper**
American Brass Co., Waterbury, Conn.
National Co., Waterbury, Conn.
Mueller Metals Co., Port Huron, Mich.
Rome Hollow Wire & Tube Co., Rome, N. Y.
Sandusky Foundry & Machine Co., Sandusky, Ohio.
Scovill Mfg. Co., Waterbury, Conn.
Wheeler Condenser & Engineering Co., Carteret, N. J.

**Brass and Copper, Small Sized**
National Co., Waterbury, Conn.
Rome Hollow Wire & Tube Co., Rome, N. Y.

**Condenser**
Wheeler Condenser & Engineering Co., Carteret, N. J.

**Gun Metal**
Sandusky Foundry & Machine Co., Sandusky, Ohio.

**Tinned**
Wheeler Condenser & Engineering Co., Carteret, N. J.

**TUMBLING BARRELS (Also see Burnishing and Polishing Barrels; Plating Barrels; Sand Blasts, Barrel.)**

**All Kinds**
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Hanson & Van Winkle Co., Newark, N. J.
Henderson Bros. Co., Waterbury, Conn.

**Foundry**
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Henderson Bros. Co., Waterbury, Conn.
Wadsworth Core Machine & Equipment Co., Akron, Ohio.

**Japanning**
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Henderson Bros. Co., Waterbury, Conn.

**Lacquering**
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Henderson Bros. Co., Waterbury, Conn.

**Oblique**
Baird Machine Co., Bridgeport, Conn.
Globe Machine & Stamping Co., Cleveland, Ohio.
Henderson Bros. Co., Waterbury, Conn.
Munning, A. P., & Co., New York-Chicago.

**TURBINES, CURTIS STEAM**
General Electric Co., Schenectady, N. Y.

**TURNINGS, CHIPS, ETC., BUYERS OF (Also see Drosses, Residues, Etc., Buyers of; Metal Dealers.)**

**TURPENTINE**
Apothecaries Hall Co., Waterbury, Conn.

**TYPE METAL (Also see Ingots.)**

**Stereotype and Linotype**
Union Smelting & Refining Co., Inc., Newark, N. J.

**VACUUM PUMPS**
Leiman Bros., New York.

**VARNISHES FOR ALL PURPOSES**
Hilo Varnish Corporation, Brooklyn, N. Y.

**VENTILATING SYSTEMS (See Blowers and Blow Piping; Dust Collectors and Ventilating Systems; Exhaust Fans and Heads.)**

**VIBRATORS**
Bennett & Seeley, Bridgeport, Conn.
Buckeye Products Co., Cincinnati, Ohio.
Hausfeld Co., Harrison, Ohio.
Malleable Iron Fittings Co., Branford, Conn.
Woodison, E. J., Co., Detroit, Mich.

**VIENNA LIME COMPOSITIONS (See Buffing and Polishing Compositions.)**

**VOLTMETERS (Also see Electrical Apparatus and Equipment.)**
Boissier Electric Co., New York.
Connecticut Dynamo & Motor Co., Irvington, N. J.
Crown Rheostat & Supply Co., Chicago, Ill.
Eager Electric Co., Watertown, N. Y.
Hanson & Van Winkl Co., Newark, N. J.
Munning, A. P., & Co., New York-Chicago.
Weston Electric Instrument Co., Newark, N. J.

**WASHING MACHINE, METAL PARTS**
Crescent Washing Machine Co.

**WASTE CLEANER AND OIL RECLAIMER**
Oakley Chemical Co., New York.

**WATTMETERS**
Weston Electrical Instrument Co., Newark, N. J.

**WHALE OIL SOAP (Also see Cleaning Compounds; Fig Cleansers.)**
International Chemical Co., Camden, N. J.

**WHEELBARROWS**
Bennett & Seeley, Bridgeport, Conn.

**WHITE METAL ALLOYS**
Union Smelting & Refining Co., [illegible], Newark, N. J.

**WHITE METALS (See Smelters and Refiners; Babbitt Metal; Ingots; Etc.)**

**WIRE CABLE, ELECTRIC**
General Electric Co., Schenectady, N. Y.

**WIRE MILL PRODUCTS (Also see Brass Mill Products; Wire.)**
Rome Wire Co., Rome, N. Y.
Standard Underground Cable Co., Pittsburgh, Pa.

**WIRE**

**Aluminum**
Aluminum Company of America, Pittsburgh, Pa.
British Aluminum Co., Ltd., Toronto, Can.
Harris, Frederick T., Sandy Hook, Conn.
Leygrand & Co., New York.

**Brass, Copper and Nickel-Silver**
American Brass Co., Waterbury, Conn.
Harris, Frederick T., Sandy Hook, Conn.
Rome Wire Co., Rome, N. Y.
Scovill Mfg. Co., Waterbury, Conn.

**Bronze**
Harris, Frederick T., Sandy Hook, Conn.

**Copper-Clad**
Standard Underground Cable Co., Pittsburgh, Pa.

**Drawing-In**
Harris, Frederick T., Sandy Hook, Conn.

**Gold and Silver**
Harris, Frederick T., Sandy Hook, Conn.

**Nichrome**
Driver-Harris Co., Harrison, N. J.

**Resistance**
Harris, Frederick T., Sandy Hook, Conn.

**Scratch Brush**
Harris, Frederick T., Sandy Hook, Conn.

**Special Metals**
Harris, Frederick T., Sandy Hook, Conn.

**WIRE CLOTH**
Smith, John P., & Co., New Haven, Conn.

**WIRE FORMING MACHINERY (See Also Cutting, Straightening and Forming Machinery.)**
Baird Machine Co., Bridgeport, Conn.

**WIRE SHAPES AND FORMS**
Warner Bros. Co., Bridgeport, Conn.

**WIRE SPECIALTIES MADE TO ORDER**
Warner Bros. Co., Bridgeport, Conn.

**WIRE STRAIGHTENING AND CUTTING MACHINERY (See Cutting, Straightening and Forming Machinery.)**

**WIRE WHEEL BRUSHES (See Brushes.)**

**WIRING DEVICES (See Electrical Apparatus and Equipment.)**

**WOOD ENAMELS (See Enamels.)**

**WOOD LACQUERS (See Lacquers.)**

**WOODFILLERS, PASTE**
Hilo Varnish Corporation, Brooklyn, N. Y.

**YELLOW BRASS (See Sheets, Munts's Metal.)**

**ZINC (See Slab Zinc; Smelters and Refiners; Anodes; Sheets; Strip Metal; Etc.)**

**ZINC, CARBONATE OF**
Asphaltum & Chemical Products Co., New York.

**ZINC CYANIDE**
Roessler & Hasslacher Chemical Co., New York.

**ZINC DUST**
New Jersey Zinc Co., New York.

**ZINC PLATING (See Electro Galvanizing.)**

**ZINC PRODUCTS**
New Jersey Zinc Co., New York.

**ZINC, ROLLED (Also see Sheets, Zinc.)**
New Jersey Zinc Co., New York.

**ZINC SALTS, COMMERCIAL**
Hanson & Van Winkle Co., Newark, N. J.
Meaker Galvanizing Co., Chicago, Ill.
Munning, A. P., & Co., New York-Chicago.
U. S. Electro Galvanizing Co., Brooklyn, N. Y.

# ALPHABETICAL INDEX OF ADVERTISEMENTS


A

Page.

Abbott Ball Co., Hartford, Conn. 50
Acme Die-Casting Corporation, Brooklyn, N. Y. 97
Aeronautical Equipment, Inc., New York 96
Ajax Metal Co., Philadelphia, Pa. 81
Allington & Curtis Mfg. Co., Saginaw, Mich. 43
Alloys & Products, Inc., New York 80
Aluminum Co. of America, Pittsburgh, Pa. 75
American Alloys Co., Baltimore, Md. 15
American Boron Products Co., Reading, Pa. 21
American, The, Brass Co., Waterbury, Conn. 87
American Bronze Novelty Works, Inc., New York 93
American Foundry Equipment Co., Chicago, Ill. 26
American La France Fire Engine Co., Inc., Elmira, N. Y. 95
American Manganese Corp., Niagara Falls, N. Y. 18
American Manganese Bronze Co., Holmesburg, Philadelphia, Pa. 81
American Nickeloid Co., Peru, Ill. 90
American Tripoli Co., Seneca, Mo. 40
American Zinc Lead & Smelting Co., New York 91
American Zinc Products Co., Greencastle, Ind. 91
Ames Sword Co., Chicopee, Mass. 41
Anthony, H. M., Co., New York 56
Apollo Metal Works, La Salle, Ill. 90
Apothecaries Hall Co., Waterbury, Conn. 60
Armstrong Cork & Insulation Co., Pittsburgh, Pa. 8
Asphaltum & Chemical Products Co., New York 51
Astle, H. J., & Co., Providence, R. I. 50
Atlantic Tank & Barrel Corporation, Hoboken, N. J. 54

B

B. & B. Mfg. Co., Inc., Indianapolis, Ind. 20
Bacon Felt Company, Winchester, Mass. 43
Baird Machine Co., Bridgeport, Conn. 49
Balbach Smelting and Refining Co., Newark, N. J. 92
Baltimore Copper Smelting & Rolling Co., Inc., New York 81
Bartley, Jonathan, Crucible Co., Trenton, N. J. 13
Bennett-O'Connell Co., Chicago, Ill. 42
Bennett & Seeley, Bridgeport, Conn. 47
Benson, H. K. & F. S., Glen Ridge, N. J. 80
Birkenstein, S. & Sons, Chicago, Ill. 78
Bliss, E. W., & Co., Brooklyn, N. Y. 29
Blumenthal, H., & Co., New York 42
Bogue, Chas. J., Electric Co., New York 45
Boissier Electric Co., New York 61
Bossert Corporation, Utica, N. Y. 94
Booth Electric Furnace Co., Chicago, Ill. 7
Boyle, John, Jr., Washington, D. C. 94
Bridgeport Brass Co., Bridgeport, Conn. 88
Bristol Brass Co., Bristol, Conn. 88
British Aluminium Co., Ltd., Toronto, Can. 76
Buchanan, C. G., Chemical Co., Cincinnati, O. 56
Buckeye Products Co., Cincinnati, Ohio 6
Burns, E. Reed, Supply Co., Brooklyn, N. Y. 43

C

Capper Pass & Son, Ltd., Bristol, England 92
Celluloid Zapon Co., New York 71
Chadwick Boston Lead Co., Boston, Mass. 54
Chase Companies, Waterbury, Conn. 87
Churchill, N. L., New York 17
Cleveland Blow Pipe & Mfg. Co., Cleveland O. 19
Cleveland Brass & Copper Mills, Inc., Cleveland, Ohio 76
Cleveland Osborn Mfg. Co., Cleveland, Ohio. 42
Clinton Metallic Paint Co., Clinton, N. Y. 15
Columbia Smelting & Refining Works, New York 92
Connecticut Dynamo & Motor Co., Irvington, N. J. 44
Cooper, Charles, & Co., New York 51
Cocoran, A. J., Inc., Jersey City, N. J. 54
Crescent Refractories Co., Curwensville, Pa. 15
Crescent Washing Machine Co., Chicago, Ill. 53
Crown Rheostat & Supply Co., Chicago, Ill. 44

D

Dallas Brass & Copper Co., Chicago, Ill. 88
Damascus Bronze Co., Pittsburgh, Pa. 70
Daylight Clean-All Co., New York 55
Davis Process Co., Brooklyn, N. Y. 31
Detroit Electric Furnace Co., Detroit, Mich. 5
De Vilbiss Mfg. Co., Toledo, O. 70
Dings Magnetic Separator Co., Milwaukee, Wis. 18
Divine Bros. Co., Utica, N. Y. 39
Dixon, Jos., Crucible Co., Jersey City, N. J. 10
Doehler Die Casting Co., Brooklyn, N. Y. 97
Driver-Harris Co., Harrison, N. J. 86
Ducber Watch Case Mfg. Co., Canton, O. 89
Duplex Buffing Machine Co., Buffalo, N. Y. 37
Dupont Chemical Works, New York 73

E

Eager Electric Co., Watertown, N. Y. 30
Eastern Felt Co., Winchester, Mass. 43
Eastern Machinery Co., New Haven, Conn. 23
Eclipse Air Brush Co., Newark, N. J. 68
Economy Machine Products Co., Chicago, Ill. 70
Egyptian Lacquer Mfg. Co., New York 72
Electric Furnace Co., Alliance, O. 2
Electric Smelting & Aluminum Co., Lockport, N. Y. 56 and 111
Elgin American Mfg. Co., Elgin, Ill. 82
Ely C. Upham, New York 41
Enameling & Stamping Corporation, Long Island, New York 93
Eureka Pneumatic Spray Co., Inc., New York 68

F

Fanning, J. P., Brooklyn, N. Y. 28
Ford, J. B., Co., Wyandotte, Mich. 59
Foreign Crucibles Corporation, Ltd., New York 14
Franco-American Chemical Works, Inc., Carlstadt, N. J. 68
Frictionless Metal Company, Chattanooga, Tenn. 79
Fuller, W. A., Company, Greenburg, Pa. 56

G

Galvanizing Corporation of America, Brooklyn, N. Y. 55
Gardner Machine Co., Beloit, Wis. 54
Garrison, A., Foundry Co., Pittsburgh, Pa. 20
Gautier, J. H., & Co., Jersey City, N. J. 14
Gebnrich Indirect Heat Oven Co. Brooklyn, N. Y. 82
General Abrasive Co., Niagara Falls, N. Y. 41
General Briquetting Co., New York 15
General Ceramics Co., New York 54
General Chemical Co., Philadelphia, Pa. 15
General Electric Co., Schenectady, N. Y. 32 and 33
General Platers' Supply Co., New York 40
Girard Smelting & Refining Co., Philadelphia, Pa. 78
Globe Machine & Stamping Co., Cleveland, O. 48
Great Western Smelting & Refining Co., St. Louis, Mo. 79

H

Handy & Harman, New York 73
Hanson & Van Winkle Co., Newark, N. J. 64 and 65
Hardinge Conical Mill Co., New York 25
Harris, Frederick T., Sandy Hook, Conn. 85 and 89
Harshaw, Fuller & Goodwin Co., Cleveland, O. 60
Hartogensis, J., Amsterdam, Holland 18
Hassall, John, Inc., Brooklyn, N. Y. 84
Hausfeld Co., Harrison, O. 10
Hawley Down Draft Furnace Co., Easton, Pa. 11
Hegeler Zinc Co., Danville, Ill. 91
Henderson Bros. Co., Waterbury, Conn. 51
Hendricks Bros., New York 89
Henning, V. & Sons, Brooklyn, N. Y. 92
Herscopf & Son, Ch., Brooklyn, N. Y. 92
Hess & Son, Philadelphia, Pa. 31
Hickory Steel Grip Glove Co., Chicago, Ill. 96
Hilo Varnish Corporation, Brook'lyn, N. Y. 67
Hoevel Mfg. Corp., Jersey City, N. J. 31
Holton Co., B. E., Los Angeles, Cal. 70
Hussey, C. G., & Co., Pittsburgh, Pa. 89
Hygein Respirator Co., Inc., New York 95

I

Ideal Furnace Co., Chester, Pa. 10
Illinois Zinc Co., Peru, Ill. 91
Improved Appliance Co., Brooklyn, N. Y. 10
International Chemical Co., Camden, N. J. 112

J

Jackson Co., John J., Newark, N. J. 89
James Ore Concentrator Co., Newark, N. J. 24
Jantz & Leist Electric Co., Cincinnati, O. 45

K

Kalamazoo Tank & Silo Co., Kalamazoo, Mich. 54
Kalbfleisch Corporation, The, New York 72
Kemp, W. H., Co., New York 76
Kenworthy, Chas. F., Waterbury, Conn. 4
Kirk & Blum Co., Cincinnati, O. 42
Knoeppel, C. E., & Co., Inc., New York 17

L

Lang, R. F., New York 80
Leavitt, C. W., & Co., New York 92
Ledoux & Co., New York 94
Lehman Bros., Hoboken, N. J. 93
Leiman Bros., New York 26
Leygrand & Co., New York 76
L'Hommedieu, Chas. F., Sons Co., Chicago, Ill. 63
Light Mfg. & Foundry Co., Pottstown, Pa. 94
Loewenthal Co., Chicago, Ill. 76 and 78

M

Mass & Waldstein Co., New York 72
Magnetic Mfg. Co., Milwaukee, Wis. 16
Malleable Iron Fittings Co., Branford, Conn. 20
Manhattan Brass Co., New York 88
Marf Machine Co., New York 97
Matchless Metal Polish Co., Glen Ridge, N. J. 38
Matthiesen & Hegeler Zinc Co., La Salle, Ill. 91
Maxon Premix Burner Co., Muncie, Ind. 10
McCullough-Dalzell Crucible Co., Pittsburg, Pa. 14
Meaker Galvanizing Co., Chicago, Ill. 68
Merchant & Evans Co., Philadelphia, Pa. 84
Metal & Thermit Corporation, New York 82
Metal Purchasing Company, New York 93
Michigan Smelting & Refining Co., Detroit, Mich 78
Midwest Brass & Copper Co., New York 90
Miner & Peck Mfg. Co., New Haven, Conn. 30
Moers, E. M., Sons, New York 92
Monarch Engineering & Mfg. Co., Baltimore, Md. 3
Mueller Metals Co., Port Huron, Mich. 83
Munning, A. P., & Co., New York-Chicago 66

N

Nassau Smelting & Rfg. Works, New York 92
National Co., The, Waterbury, Conn. 89
National Brass & Copper Co., Lisbon, O. 88
National Sheet Metal Co., Peru, Ill. 90
New Era Mfg. Co., Kalamazoo, Mich. 93
New Haven Sand Blast Co., New Haven, Conn. 27
New Jersey Tube Co., Newark, N. J. 88
New Jersey Zinc Co., New York 77
New Standard Hardware Works, Inc., Mount Joy, Pa. 55
New York Buff Co., New York 41
New York Testing Laboratories, New York 94
Ney, The J. M. Company, Hartford, Conn. 74
Niagara Emery Mills, New York 41
Nikolas, G. J., & Co., Chicago, Ill. 69
No-Dust Drying Machine Co., Providence, R. I. 52
North American Smelting Co., Philadelphia, Pa. 79
North Atlantic Metal Corp., New York 92
Northern Engineering Works, Detroit, Mich. 18
Norton Company, Worcester, Mass. 35
Norton Laboratories, Inc., Lockport, N. Y. 18

O

Oakley Chemical Company, New York 58 and 59
Obermayer, S., Co., Chicago, Ill. 12

P

Pangborn Corporation, Hagerstown, Md. 24
Paxson, J. W., Co., Philadelphia, Pa. 11
Pecora Paint Co., Philadelphia, Pa. 19
Penn Chemical Works, Philadelphia, Pa. 52
Pittsburgh Electric Furnace Co., Pittsburgh, Pa. 11
Platt Bros. & Co., The, Waterbury, Conn. 80
Pryibil, P., Machine Co., New York 30

Q

Queen Brass & Copper Co., New York 90
Quigley Furnace Specialties Co., Inc., New York 15

R

Radnai, Josef, New York 93
Richards & Co., Boston, Mass. 111
Ricketts & Co., New York 94
Rockwell, W. S., Co., New York 12
Roessler & Hasslacher Chemical Co., New York 57
Rome Hollow Wire & Tube Co., Rome, N. Y. 89
Rome Wire Co., Rome, N. Y. 89

S

Sandusky Foundry & Machine Co., Sandusky, O. 84
Schweizer, Chas. K., St. Louis, Mo. 28
Scovill Mfg. Co., Waterbury, Conn. 86
Seidel, R. B., Inc., Philadelphia, Pa. 16
Seymour Mfg. Co., The, Seymour, Conn. 88
Shawinigan Electro-Metals Co., Ltd., Cleveland, Ohio 17
Shore Instrument & Mfg. Co., Inc., New York 31
Shuster, F. B., Co., New Haven, Conn. 28
Sievering, Philip, New York 55
Silvel Metal Co., New York 79
Sly, W. W., Mfg. Co., Cleveland, O. 23
Smith, John P., & Co., New Haven, Conn. 51
Smith & McCrorken, Inc., New York 90
Smith-Richardson Co., Attleboro, Mass. 50
Soderling, Walter, New York 97
Solvay Process Co., Syracuse, N. Y. 58
Standard Rolling Mills, Inc., Brooklyn, N. Y. 89
Standard Equipment Co., New Haven, Conn. 22
Standard Underground Cable Co., Pittsburgh, Pa. 88
Stearns, A. T., Lumber Co., Boston, Mass. 54
Steiner, E., Newark, N. J. 82
Stenson, Andrew, New York 94
Stevens, Frederic B., Detroit, Mich. 9
Strahs Aluminum Co., New York 76
Superior Metal Co., New York 96
Surface Combustion Co., New York 14

T

Taunton-New Bedford Copper Co., New Bedford, Mass. 88
Taylor, Robert J., Inc., Philadelphia, Pa. 15
Taylor Instrument Companies, Rochester, N. Y. 45
Thinsheet Metals Co., Waterbury, Conn. 86
Thompson, S. H., Chemical Laboratories, Dayton, Ohio. 94
Tolhurst Machine Works, Troy, N. Y. 52
Torrington Mfg. Co., Torrington, Conn. 28
Trotter & Co., Nathan, Philadelphia, Pa. 92
Trumpbour-Whitehead Brass & Copper Co., New York 90
Turner Machine Co., Philadelphia, Pa. 29

U

Union Smelting & Refining Co., Newark, N. J. 110
United American Metals Corp., Brooklyn, N. Y. 80
United Metals Selling Co., New York 91
U. S. Electro Galvanizing Co., Brooklyn, N. Y. 1
United States Lacquer Co., Inc., Brooklyn, N. Y. 72
U. S. Reduction Co., E. Chicago, Ind. 79
U. S. Silica Co., Chicago, Ill. 23
U. S. Smelting Furnace Co., Belleville, Ill. 11
United States Smelting, Refining & Mining Co., New York 87

V

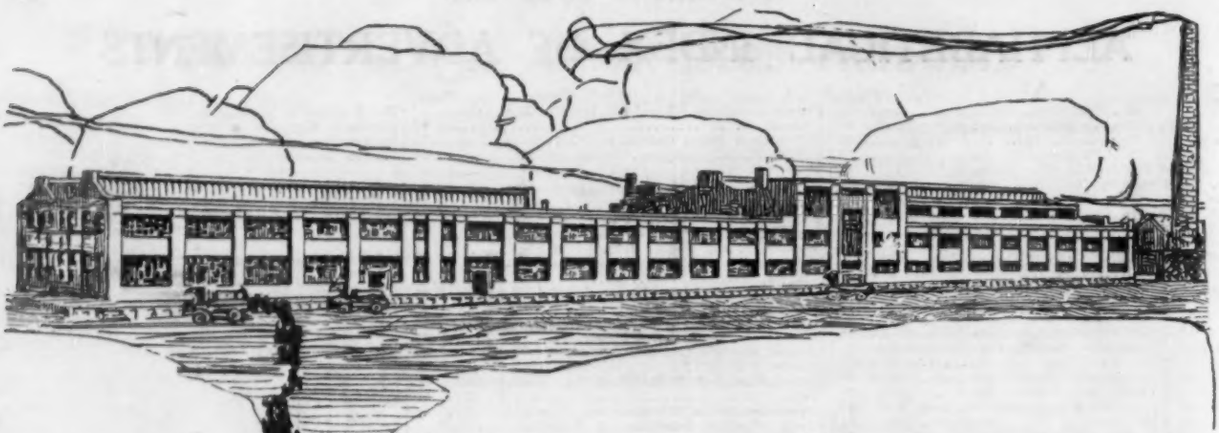
Vesuvius Crucible Co., Swissvale, Pa. 14
Victor Mfg. Co., Springfield, Ohio. 46

W

Wadsworth Core Machine & Equipment Co., Akron, O. 20
Warner Bros. Co., Bridgeport, Conn. 30
Warren Products Co., New York 16 and 40
Waukegan Chemical Co., Waukegan, Ill. 47
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. 74
Watrous, E. L., Galvanizing Co., Chicago, Ill. 31
Watson-Stillman Co., New York 28
Webster & Perks Tool Co., Springfield, O. 38
Weil, Louis, New York 93
Wenger, Paul, & Co., New York 92
Weston Electrical Instrument Co., Newark, N. J. 45
Wheeler Condenser & Engineering Co., Carteret, N. J. 85
Whipple & Choate, Bridgeport, Conn. 72
White & Bro., Philadelphia, Pa. 81
Wiarda, John C., Co., Brooklyn, N. Y. 54
Winchester, B. & C., Co., West Winsted, Conn. 88
Wolffgram, L., Erie, Pa. 31
Woodson, E. J., Co., Detroit, Mich. 37

Y

Yorkville Mfg. Co., Brooklyn, N. Y. 43



UNION

# A Striking Example of Union Efficiency

RECENTLY we were making shipment of a carload of white metal alloys on a special rush order to enable a certain manufacturer to get a special rush order of his out on time. The car was loaded, weighed, sealed and ready to be hauled away when another wire came in at 5 P. M. asking for 10,000 pounds of the same metals to be loaded into the same car. Ordinarily such an order at such a time would have been held over till the following day, but not so at UNION. A hurried plant call was sent out, the entire force volunteered to remain on the job—the metal was turned out, loaded into the same car and shipped —THE SAME DAY—a striking example of Union efficiency.

We term that SERVICE of the highest calibre, yet it is no unusual occurrence here. Such service plus the numberless other advantages UNION offers in white metal alloys, *must* command your attention. Tell us what you use in white metal alloys and let us do the rest. Write us.

**Union Smelting & Refining Co., Inc.**
Main works: St. Charles St. & Ave. L.
Newark - - - New Jersey
Branches: Chicago, Baltimore, Detroit

*The Efficiency of Specialization*

UNION

GENERAL LIBRARY
NOV 12 1919
UNIV. OF MICH.
NOV 11 1919
LIBRARIAN'S DESK

THE METAL INDUSTRY
WITH WHICH ARE INCORPORATED
THE ALUMINUM WORLD: COPPER AND BRASS: THE BRASS FOUNDER AND FINISHER:
ELECTRO-PLATERS REVIEW.
99 JOHN STREET, NEW YORK

# ANNOUNCEMENT

Dear Sir:-

You have probably guessed why you have not received your copy of the October number of THE METAL INDUSTRY. The delay is due to the printers strike which has paralyzed the trade journal industry in New York City.

We hope, however, to send you a complete copy within the next two weeks and the November and December issues will follow in due course.

## FOR SALE AND WANT ADVERTISEMENTS

In the meantime we herewith send you this four-page leaflet containing our current WANT ADVERTISEMENTS. Answers sent in our care will be forwarded.

## SUBSCRIPTION RATE

We also take this occasion to call your attention to the fact that THE METAL INDUSTRY, despite its growth and despite the increased cost of production, still costs only ONE DOLLAR PER YEAR (Foreign Two Dollars)—the same rate that it was when it was only a 28 page paper. — At present the size of our jounral is 168 pages; 48 pages of reading and 120 pages of advertising.

If the production costs continue to increase, we feel that we will have to raise the subscription price, but in the meantime we give all our old subscribers the opportunity to renew their subscription for one year at ONE DOLLAR. (Foreign Two Dollars).

We trust that we may have the pleasure of retaining your name on our subscription list. Enclosed is subscription blank. Please mark on the blank your departments. Upon receipt of your remittance we will renew your subscription for one year from the date of expiration.

Yours truly,

THE METAL INDUSTRY
99 JOHN STREET
NEW YORK

(OVER)

# FOR SALE—EQUIPMENT, ETC.

## FOR SALE
## SHEET METAL SCRAPER, NEW

Manufactured by Waterbury Farrel & Foundry Co., Waterbury, Conn.

Specifications

| | |
|---|---|
| Length of table on top | 68" |
| Width of table on top | 31" |
| Stroke of scraping tool | 9" |
| Strokes per minute | 200 |
| Transverse motion of table | 30" |
| Longitudinal motion of table | 60" |
| Diameter of fly wheel | 22" |
| Face of fly wheel | 4½" |

With bronze gibs and with tight and loose pulleys

Address your inquiries to:

R. POLIAKOFF

711 Flatiron Building, New York City

## ELECTRIC PLATING UNIT

FOR SALE—Consisting of 17 H. P. Motor, 220 Volts, D. C. and 10 KW. 500 Amperes, 20 Volt Generator. Speed of entire unit 950 revolutions per minute. Price reasonable. Address

MARLOW MANUFACTURING COMPANY

Cleveland, Ohio

## MOTOR - GENERATOR SET

FOR SALE—One Plating Motor-Generator Set. Dynamo 1500 Amperes at 6 Volts, Shunt wound, separate excited, exciter included; direct connected on same sub base to a 15 h.p., A. C. Motor complete with starter. (New outfit, uncrated, fully guaranteed.) Address;

MOTOR
Care THE METAL INDUSTRY

## ADVERTISE YOUR WANTS IN

## THE METAL INDUSTRY

## EMERY

FOR SALE—At a bargain, 200 lbs. Ground Emery. Different grades.

GROUND EMERY
Care THE METAL INDUSTRY

FOR SALE—About 5000 lbs. half hard sheet brass 3¾" wide by 22 B. & S. guage in random lengths; mostly 6 to 10 feet long; best quality. Also about 1000 lbs. same as above, only 1¾" wide.

UNBREAKABLE MIRROR COMPANY

Hackettstown, N. J.

## CONCENTRATING TABLE

FOR SALE—1 Wifley Laboratory concentrating table , suitable for brass foundry, practically new. Cheap.

LEITELT BROS.,
7725-7733 So. Chicago Ave., Chicago, Ill.

## MELTING FURNACE

FOR SALE—Two Rockwell tilting reverberatory brass melting furnaces, 1000 lb. capacity.

L. LAPAT CO.,
Paterson, N. J.

## TILTING FURNACE

FOR SALE—Two Brass Tilting Furnaces approximately 800 pounds capacity. Second hand but in good condition. Bargain.

Oct - 2
Care THE METAL INDUSTRY

## TESTING MACHINE

FOR SALE— One 10,000 lb. capacity Tinius-Olsen Testing Machine, A - 1 condition. Very reasonable price.

THE TOLEDO BRIDGE AND CRANE CO.,
Toledo, Ohio

## MACHINERY

FOR SALE—14 Torrington Type overhauling or scraping machines.

S - 7
Care THE METAL INDUSTRY

## PLATING DYNAMO

FOR SALE—2500Amperes, 8 Volt, 750 R. P. M. with Rheostat and Pulley, built by Connecticut Dynamo & Motor Co., practically new, guaranteed in fine condition.

THE OSBORNE & SEXTON MCHY. CO.
COLUMBUS, OHIO.

Second hand polishing lathes and used rag wheels For Sale Cheap.

WALSH'S SONS & CO., Newark, N. J.

## PATENT FOR SALE

Patented Metallic Alloy. Can be used as a metallic packing or brake shoe lining. Good opportunity for progressive manufacturer. Address

PATENT,
Care THE METAL INDUSTRY

## NITRATE OF SILVER

FOR SALE—Subject to prior sale: 70 POUNDS NITRATE OF SILVER.

INDIANA LAMP COMPANY

Connersville, Ind.

THE METAL INDUSTRY TRADE WANTS

# WANTED—EQUIPMENT, ETC.

## BRASS FURNACE

WANTED—Brass Furnace—capacity 1,000 lbs. to 1,500 lbs. State make, type, kind of fuel, length of service, condition and best price.

S — 5,
Care THE METAL INDUSTRY

## METAL SAW TABLE

WANTED—Sheet metal saw table divided lengthwise throughout the middle, into movable half and stationary half, 12 to 14 feet long, single or more cuts, all automatic feed. Must be in perfect condition. Address

Oct. - 1
Care THE METAL INDUSTRY

## PLATING GENERATOR

WANTED—1000 to 1500 ampere plating generator, Hanson & Van Winkle make preferred. State number and specifications of what you have to offer and prices. Address

BECTON, DICKINSON & CO.,
Rutherford, N. J.

## BUFFING WHEELS

WANTED—Old seconded buffing wheels loose or sewed...Loose buffs 7" and up, and the sewed buffs 8" and up, in any quantity. Address

O. C. RACK,
2729 Coyne St., Chicago, Ill.

## PLATING DYNAMOS

WANTED—Cash paid for Plating Dynamos any size, give complete description, make, capacity, and condition.

ROSE ELECTRIC CO.,
6401 State St., Chicago, Ill

## PLATER

WANTED—A chandelier plater for chandelier and custom work; steady work the year round. Married man preferred. Address

X,
Care THE METAL INDUSTRY

# SITUATIONS OPEN

## SALESMAN

WANTED—Man with executive ability and thorough knowledge and experience in the manufacturing and selling of bronze bushings, bearing and car boxes.

S - 17,

Care of THE METAL INDUSTRY

## BRASS ROLLER

WANTED—Must be first class roller experienced on sheet brass mills. The opening offers good wages and steady work under first class conditions. Applicant must be an American Citizen and should be a married man between 30 and 40 years of age. It will pay any man that can produce the goods and that is used to earning good money to answer this ad. Give your age and experience in your answer.

SHEET BRASS

Care THE METAL INDUSTRY

## BRASS FOUNDRY FOREMAN

WANTED—Connecticut Manufacturer wants first-class foreman for Brass Foundry producing small castings. Must be thoroughly familiar with yellow brass castings and uptodate foundry practice. Correspondence confidential. Address.

C. F. F.
Care THE METAL INDUSTRY

## COPPER ROLLER

WANTED—OPPORTUNITY FOR MAN experienced in copper rolling work. Very good permanent position will be given to person who answers our qualifications. Reply, giving in detail experience, age, salary expected, etc.

COPPER ROLLER C/o METAL INDUSTRY

## FOREMAN

WANTED—First-class foreman who understands the manufacture of Yellow and Red Ingots and Aluminum Ingots,

RED INGOTS,
Care THE METAL INDUSTRY

## FOREMAN PLATER

WANTED—Foreman to take charge of large Plating Department. One who understands still tank, machine and barrel plating. Must also be familiar with chemical or pigment finishes. State age, experience and wages expected. Address.

HARDWARE
Care THE METAL INDUSTRY

## DRAFTSMAN

WANTED—Chief draftsman, also several young draftsmen with some experience on brass goods, Plumbing supplies, valves, etc.

BRASS MANUFACTURER
Care THE METAL INDUSTRY

## PLATER

WANTED—Foreman Plater in small but growing plant. Must be able to handle men as well as solutions; nickel, copper, brass and silver, brushed brass, tap bronze, etc., Location New York; state age, references and salary expected.

GROWING PLANT C/o METAL INDUSTRY

## PLATER

WANTED Foreman to take charge of department employing thirty men. Must have experience on silver plate holloware and fancy finishes on brass and copper. Give full details of experience and wages desired. Address

HOLLOWARE
Care THE METAL INDUSTRY

## PARTNER

WANTED—Partner in Job plating plant, good future and little cash. Worth your time to investigate.

HARRY LEWIS
690 - 6th Ave., New York City

## PLATERS ATTENTION

FOR SALE—Plating and Casket Hardware business, 80 years established, centrally located in a western Massachusetts city, plenty of work all year round, owner has other business interests that keep him away. Am also willing to go in partnership with right party if so desired.

FRANK STARIN,
Springfield, Mass

## FOREIGN AGENCY

WANTED—To represent American manufacturers in France Will specialize in iron mongery, hardware, metal specialties and other export products. Address

FOREIGN AGENCY
Care THE METAL INDUSTRY

# SITUATIONS WANTED

## SALESMAN

SITUATION WANTED—Salesman; Foreman Plater with selling experience wants Salesman position with Platers Supply House. Western Territory preferred. Thoroughly familiar with platers supplies from actual experience. Best of references. Address

Oct. - 5
Care THE METAL INDUSTRY

## CHEMIST & METALLURGIST

SITUATIONWANTED—Chemist and Metallurgist. 23 years old, Technical Graduate, 10 years experience in chemical lines. Past four years Chief Chemist in brass rolling mill, familiar with all mixtures, desires a position with a live concern with chance for advancement. Four years in paper-mill laboratory, familiar with soaps, nitrocellulose, have had analytical experience with all materials used in the above manufacturing plants. At present employed, references, will pay half my expense for a personal interview.

Oct. - 3
Care THE METAL INDUSTRY

## DIE CASTING EXPERT

SITUATION WANTED—A man of several years experience seeks position. Has held positions as die department foreman and superintendent. A designer of casting machines and dies and is familiar with white metal and aluminum. Has a good knowledge of the die casting business in general.

DIE CASTINGS
Care THE METAL INDUSTRY

## BRASS FOUNDRY FOREMAN

SITUATION WANTED—A brass foundry foreman with a total of eighteen years of experience on brass, and aluminum castings, including twelve years as a moulder and three years as a core maker, desires new connections.

Is thoroughly experienced in mixing metals, has operated almost every type of oil and gas furnace, and is capable of breaking in new help on all branches of foundry work.

At present is employed as a general foundry foreman but prefer to be brass foundry foreman.

If you are interested write

GENERAL FOREMAN
Care THE METAL INDUSTRY

## PLATER

SITUATION WANTED—Plater, 14 years' experience mixing solutions and producing any finish on all metals. Capable of taking charge. Reference.

S - 21,
Care THE METAL INDUSTRY

## PLATER

SITUATION WANTED—Foreman Plater desires to make a change and would like to connect with a reliable firm where the services of a competent man are indispensable. Expert on all solutions and capable of maintaining normal conditions economically. Familiar wth all popular and special finishes, all modern methods in connection with polishing, lacquering and barrel plating. Capable of installing plants. Can furnish A-1 references. Address

P. H.
Care THE METAL INDUSTRY

## SUPERINTENDENT

SITUATION WANTED—Position as Foundry or Mill Superintendent with a responsible concern in the non-ferrous metal business. Have 11 years experience and thoroughly understands refining, sand casting, chill casting, rolling, drawing and die-castin of all non-ferrous metals. Adapt in machine shop practice and production work. Technical graduate. Best of references furnished.

Oct. 7
Care THE METAL INDUSTRY

## SUPERINTENDENT

SITUATION WANTED—Brass Foundry Superintendent who is thoroughly posted on up-to-date foundry practice; large or small castings, any class of metal, or can take charge of refining plant refining all kinds of white metal drosses or foundry residues. Steam goods preferred. Address

M. B.
Care THE METAL INDUSTRY

## SMELTER - REFINER

SITUATION WANTED—Non-ferrous metallurgist has had ten years on blast furnaces and reverbs-construction and operation. Specialized on copper, but has been in foundry game since leaving the Srevice. Prefers operation or metallurgical research with a secondary or industrial metal concern, copper, brass aluminum or white metal alloys. Excellent past record. Full data upon request.

O - 4
Care THE METAL INDUSTRY

## FOREMAN

SITUATION WANTED—Foreman for several years experienced on extruding and piercing machines, wishes to change position. Would go to foreign country.

A. E. W.
Care THE METAL INDUSTRY

## FOREMAN PLATER

SITUATION WANTER—Foreman plater specialty copper, brass and nickel plating, familiar with all standard finishes, fifteen years experience. Address

PRACTICAL
Care THE METAL INDUSTRY

## POLISHER BUFFER FOREMAN

SITUATION WANTED - As polisher or buffer foreman on metal hand bag or pocket book frames. I know the best way to polish and buff frames and all kinds of metal noveltie . Good hustler, 14 years experience. Age 33. Married. Wishes steady position as foreman or polisher buffer. Willing to go any place in the U. S. Best reference.

MORRIS GENDEL, 388 Williams Ave., Brooklyn, N. Y.

## FOREMAN PLATER

SITUATION WANTED—By Plater who is expert in gold, silver, brass, bronze, nickel, copper, lacquering and japanning. Also galvanizing in still tanks or barrels. Wages reasonable. Will go anywhere.

EXPERT PLATER
Care THE METAL INDUSTRY

## ETCHER

SITUATION WANTED—By an expert etcher, who thoroughly understands the best and uptodate methods. Can teach any branch of the art in a few days time and supply all formulas, etc. Address

SIMPLE METHODS,
Care THE METAL INDUSTRY

ESCO

PURE ALUMINUM
NICKEL ALUMINUM
MANGANESE BRONZE
MANGANESE COPPER
SILICON COPPER

Thirty-three years behind the quality of Esco products! We ought to know how, don't you think? Esco Ingots make Profitable Castings. Try us.

The Electric Smelting & Aluminum Co.
Lockport, N. Y.

INGOTS

RICO PRODUCTS

PUREST
PIG LEAD
we sell is
PRIME WESTERN
We can also furnish
REMELTED
which usually contains a little tin. Perhaps for this reason you would prefer it. Furthermore, the price usually
IS
LOWER
WE SELL "EVERY METAL THE BRASS FOUNDER NEEDS."
RICHARDS & COMPANY, Inc.
ESTABLISHED 1812
200-206 CAUSEWAY STREET
117-125 BEVERLY STREET . . . . BOSTON

RICO PRODUCTS

FOR INDEX TO ADVERTISEMENTS, SEE PAGE 109

# Bring Your Metal Cleaning Troubles To Us

IF SOME Metal Cleaning Problem is bothering you either in the matter of expense or results, don't waste your good time in experimenting; turn the matter over to us for solution; that is our business. We specialize in materials and methods for Metal Cleaning of any kind or character, our laboratories and experts are at your command without cost to you. We are always ready and willing to point the true way to the overcoming of any Metal Cleaning trouble and the service of our plant and experts are yours for the asking; make use of them.

## International Chemical Co.

**Camden, New Jersey**

**Chemicals for the Cleaning of Metal Work Our Specialty**